CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY

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Thesis presented for the
Degree of Doctor
of
Commerce
at the
University of Stellenbosch

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Stellenbosch

November 1977

Opgedra aan Miemie, Pieter en Theuns

" ... sonder My kan julle
niks doen nie."
Johannes 15:5.

In nederige erkentlikheid teenoor my Skepper vir geleenthede en gesondheid, sonder Wie se grenslose genade hierdie studie nie moontlik sou gewees het nie.

ACKNOWLEDGEMENTS

There are several people without whose help it would not have been possible to complete this study.

A special word of thanks to my promotor, Prof. A.E. Scheurkogel, who, coping with an unenviable work load, devoted much time and effort, to guiding this study, and who made it possible for me to submit my thesis in time for the December graduation ceremony.

I am indebted to Dr D.J. Mouton, co-promotor and external examiner, for his encouragement and useful comment.

Prof. D.G. Franzsen, who acted as internal examiner, I wish to thank for his authoritative comments and positive criticism.

Dr A.P.T. du Toit, internal examiner, devoted much time and gave invaluable assistance with regard to the statistical preparation, for which I wish to thank him.

Mr H.F. Snijders, from the Department of English at this University, for editorial and language services rendered, I thank for the many hours he had spent.

A special word of thanks to Mrs De Waal, who did most of the

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typing, often under undue pressure. To the other people who also helped with the draft typing, including my mother, I am grateful.

Without the help and friendly cooperation of the officials of the Department of Statistics this study would not have been possible. I am greatly indebted to them.

I also wish to acknowledge the financial assistance of the Human Sciences Research Council in this research. Opinions expressed in this work or conclusions reached are entirely my own and must in no way be regarded as a reflection of the opinions and conclusions of the Human Sciences Research Council or any other person or persons whatsoever.

A word of thanks also to everybody else who has contributed in the way of assistance, advice and encouragement. Here I particularly wish to single out my parents.

Finally, my thanks and appreciation to my wife and two sons for their patience and understanding.

P.G. DU PLESSIS
Stellenbosch
December 1977

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CHAPTER 1

AIMS, PURPOSE AND METHODOLOGY OF THE STUDY

1.1 INTRODUCTION

Studies on industrial concentration and structure are very common in most developed countries. With the results of such basic data available, doors to numerous other related topics of economic study are opened, such as studies on the relationship between firm size and profitability, optimal concentration, economic progress and concentration, combinations and concentration, trends in concentration, international comparison of concentration, competition policy, to name but a few. Such studies are to a large extent dependent on some form of basic concentration data. The almost complete lack of quantitative and representative basic concentration data on the South African economy gave stimulus to this study.[1)] The author trusts that the basic data analysed in this study will aid research on topics related to concentration of economic power and industrial structure and may also be useful in the formulation of economic policy in both the private and the public sectors of the country's economy.

With the helpful co-operation of the Department of Statistics official data on concentration of economic power in

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1) Previous attempts to supply concentration data of this kind, suffered shortcomings of classification, scope, economic relevance, etc. as is pointed out by the authors cited below:

Cf. Hulsermann K.R., A critical assessment of different measures of economic concentration, Dissertation: M B A., University of the Witwatersrand, 1975; Tregenna-Piggot J. V., Concentration and South African Industry, unpublished article, 1976; Tregenna-Piggot J.V., The Structure and Performance of South African Manufacturing Industry, unpublished article, July 1975. See also the Report of the Commission of Inquiry into the Regulation of Monopolistic Conditions Act, 1955, RP 64/1977, par. 57.

South Africa, similar to those supplied by the Bureau of the Census in the United States of America, became available, initially for the purposes of the Mouton Commission,[2] and now also for this study. It was possible to extract and present the relevant data within the limitation set by the Department of Statistics according to the secrecy clause of the Statistics Act.[3]

The role played by large enterprises and corporations in various sectors[4] of the economy is constantly under the watchful eye of various public authorities and of persons advocating their social responsibility towards the community in which they operate, as well as academics. These large enterprises and corporations with their concentrated economic power can influence competition, public interest, economic progress and stability and even the national interest. In some instances the economic health of such corporate giants has become so important that the national governments concerned dare not allow them to fail because of the possible disastrous consequences for their national economies.[5] Cases in point are Anglo American Corporation of South Africa Ltd., the British Motor Corporation in the United Kingdom and the electronics and motor industries of the United States of America.

As long as the possessors of extensive economic power employ this power judiciously they may well serve the public

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2) The Commission of Inquiry into the Regulation of Monopolistic Conditions Act, No. 24 of 1955, appointed by the Minister of Economic Affairs under the Chairmanship of Dr. D.J. Mouton, who replaced the late Dr. L.C. Steyn.

3) Statistics Act, No. 66 of 1976, Section 8.

4) At this stage the reader is reminded that, where applicable, concepts and definitions used in this study are those of or related to the Standard Industrial Classification of All Economic Activity, Department of Statistics, Government Printer, Pretoria, 1970.

5) Cobbs, J., "When Companies get too Big to Fail," Business Week, 27 January, 1975, p. 16.

and the national interest. Unfortunately this does not always happen. The development of restrictive trade practices[6] and other abuses detrimental to the public interest have in many countries compelled governments to interfere in the free enterprise system.

Even though enterprises (firms, undertakings, corporations) in the South African economy are not identified[7] in this study, the structural analysis and concentration indices provided give a good indication of the industries in which monopolistic or oligopolistic conditions prevail.

This does not imply that a high concentration of economic power or a monopolistic market structure is ipso facto detrimental to the public interest. There are certainly some industries where it can actually be in the public and national interest, especially in an economy with such unique structural characteristics as in South Africa.[8] For the first time, quantitative proof of concentration is provided, outlining the actual structure of the manufacturing industry in South Africa as regards the number of firms and their size distribution. This also includes data on the number of small firms, generally accepted as essential in a capitalistic economy, and their relative size in the various industries.

Continuous, or at least periodic, monitoring of the concentration of economic power is useful not only for the study of economic theory, but also to those responsible for continuously evaluating and adapting official economic

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6) Definitions of concepts and practices will be given and evaluated where relevant in the text.

7) Because of the secrecy clause in the Statistics Act, 1976.

8) See 2.4.1, p.41 : Advantages of Concentration of Economic Power, and 6.3, p.156: General remarks on South African Industrial Conditions, in this study.

policy regarding, inter alia, competition policy.[9] From such data the advantages, disadvantages and risks arising from the concentration of economic power can be determined.

Prerequisites for the survival of the capitalist system, such as freedom of choice, responsible initiative, equal opportunity and unrestricted competition within the bounds of social and legal requirements, can be maintained by government and others through action based on conditions and practices uncovered by quantitative concentration data. The necessity of such data on concentration for the analysis of matters referred to above, was also stressed by those responsible for investigating such matters.[10]

Awareness of the value and importance of comprehensive data on the concentration of economic power when dealing with matters of economic policy is reflected in the terms of reference of the Commission of Inquiry into the Regulation of Monopolistic Conditions Act, No. 24 of 1955. This directive required the Commission, inter alia, " ... to report upon -

(a) the tendency towards the forming of economic power concentrations in the Republic of South Africa by

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9) Alfred Marshall showed awareness of this changing of circumstances as far back as 1890 when he remarked: "Economic conditions are constantly changing and each generation looks at its own problems in its own way." Marshall A., Principles of Economics, Eighth Edition, London, MacMillan and Co. Ltd., 1952, preface to the Eighth Edition, p.v.; Mouton gives a comprehensive survey of the variety and development of restrictive trade practices policy in several countries. Cf. Mouton D.J., The Behaviour of the Firm and the Problem of Restrictive Trade Practices, J.L. van Schaik Ltd., Pretoria, 1974, Section B.

10) For a comprehensive discussion of these aspects, see Singer E.M., Antitrust Economics, Englewood Cliffs, Prentice Hall, 1968, pp. 15 - 24.

merger or take-over or in any other way whatsoever, including concentrations not directly or indirectly restricting competition;

(b) the advantages and disadvantages of such power concentrations viewed from the angle of the public interest;

(c) ...

(d) the legislation which is considered necessary to eliminate competition not justified in the public interest."[11)]

This study is mainly concerned with the first of the points of reference cited above. Unfortunately the statistical data on which this analysis is based are only available from 1966 up to 1972. This six year period is considered too short to indicate any significant change in industrial structure. It will, however, provide scope for future analysis, should data over a ten-year period become available.

The second term of reference is also covered, as well as a specific aspect of the fourth.

In the United States of America concentration data of the kind envisaged in this study are considered absolutely essential to aid economic policy and planning: "These data are absolutely essential to understand trends in the economy. They are indispensable to the kind of serious policy planning we are now involved in."[12)]

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11) Government Gazette, No. 4838, 5 September 1975, Department of Commerce, No. 1705. Commission of Inquiry into the Regulation of Monopolistic Conditions Act.

12) "Business Gets a New Measure of Bigness," Business Week, January 27, 1973, pp. 80 - 81.

A study on the concentration of economic power can be seen as the analysis of firm size distributions in particular sectors of the economy or in the economy as a whole. Such an analysis gives insight into the structure of such sectors and ultimately into the structure of the economy as a whole.

Concentration of economic power as a concept implicitly refers to the ability of an enterprise, firm or establishment, depending on the classification used,[13] to influence the activities, policies, practices, market conditions, etc., of a specific industry or market. To be able to exert such influence the undertaking in question must possess some form of economic power, be it substantial market dominance, financial backing, expertise, production capacity, technical knowhow, assets, or any other form of power. For the measuring of economic power concentration it is the inequality of distribution of these variables amongst the units (a collective term denoting enterprise, firm, establishment, undertaking, etc.)[14] in that sector or industry that are of interest.

To avoid misunderstanding it is necessary to point out that there is no material difference in the meaning of the following concepts when used to denote some kind of size distribution of the units in a particular sector of the economy or in the economy as a whole: concentration of economic power, economic concentration, or industrial concentration. They may employ one or more of several variables[15] to express concentration, but are still merely different names for the same phenomenon. For the sake of uniformity, preference was given to the former two concepts, namely concentration of economic power, and economic concentration.

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13) See 4.5, page 102 of this study in this regard.

14) See 4.3, page 94: Levels at which concentration can be measured.

15) See 4.4, page 97 of this study in this regard.

The concept concentration of economic power can broadly be viewed from at least three angles.[16)]

First, to denote the economic power vested in the hands of one unit or of the few largest units in the economy, thus a macro approach. The ability of such units to influence economic activity and even economic policy on a broad front is then taken into account. The conduct and sense of responsibility of such units are usually of the utmost strategic, national, and economic importance.

Under the same approach, economic power vested in the hands of one unit or of the few largest units in a particular industry of the economy can be determined, thus a micro approach. This approach can be used to ascertain the existence, or otherwise, of monopolistic and restrictive trade practices or possible abuses of economic power in particular industries in the economy.

A second approach takes into account all the units in the economy, or in a particular industry, for determining economic concentration. Under this approach the importance and the influence of the large number of small units are acknowledged. In terms of this approach, measures used to determine concentration are based on the inequality of a size distribution of some relevant variable in the universe being measured. Such measures are known as summary measures of concentration.

Under a third approach, economic concentration is again expressed in terms of all the units in the universe, but here the share of the cumulative number of units are expressed in terms of their cumulative share or dominance of a relevant variable. According to this approach, which is a function of the degree of inequality and the number

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16) Different measures for determining concentration have been developed to suit each of these approaches. See 4.6, page 106 of this study in this regard.

of firms, national economies or industries can be compared on a relative basis which does not take into account absolute concentration. By means of this approach it is therefore not possible to indicate absolute concentration in an economy or industry and comparisons can be made only on a relative basis.

1.2 PRIMARY OBJECTIVE OF THIS STUDY

In view of the absence of sufficiently representative data on the concentration of economic power in the Republic of South Africa, the primary objective of this study is to furnish such data on a comprehensive basis in the form of concentration indices, compiled by measures (techniques) applicable to all three approaches.

The main emphasis of this study and the development of these indices relate to manufacturing as classified in the Standard Industrial Classification of all Economic Activities.

Concentration data on wholesale and retail and on construction were also compiled in passing, according to the same classification but not as comprehensively as in the case of manufacturing.

1.3 SECONDARY OBJECTIVES OF THIS STUDY

Once the primary objective of this study has been defined, a number of secondary objectives arise either directly from the primary objective or as an extension thereof.

Firstly, detailed analysis of the structure of manufacturing in terms of the four variables namely, number of firms, distribution of turnover, distribution of employment and distribution of fixed assets, to supplement the concentration data based on the three last-named variables will be undertaken.

Secondly, concentration of economic power can take place through various means[17] and practices. A short exposition of these means is given and the main advantages and disadvantages that economic concentration can have for the economic system in which it occurs are outlined in the following chapter.[18]

Thirdly, the basic question of applying a measure to determine economic concentration is not as easy as it may seem. Consensus regarding the best measures, or even measure, to be used has not yet been reached and is not likely to be reached for some time.[19] For this reason the best known measures developed according to the three basic approaches to analyse concentration of economic power are outlined, with emphasis on their advantages and shortcomings. The intricate mathematical mechanics were not delved into but references in this regard are included. A comparison of the results obtained by the various measures ultimately employed in this study should contribute to the numerous comparative studies already undertaken in this field.[20]

Fourthly, irrespective of the measure used to determine economic concentration, the data to which it is to be applied are also a constant source of frustration to the analyst. Finding suitable data and obtaining permission to use them can be a formidable task. To make a contribution in this regard, three variables were used constantly for most of the indices compiled on manufacturing.[21] These indices were then compared as to their correlation and concordance to determine whether they can be used interchangeably.

The fifth objective of this study is to present some indication of a feasible quantitative cut off-point in industry dominance that can be applied in the South African market

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17) See 2.3, page 30 of this study.

18) See chapter 2.4, pages 41 - 63 of this study: The effects of economic concentration.

19) See 4.2, page 91 of this study. What is a measure of concentration?

20) See 5.2, page 130 and 7.5 page 188 of this study.

21) See 5.3.1, page 140 of this study. Variables employed.

situation for purposes of defining monopoly and oligopoly with regard to competition policy.[22] This was done after outlining the relevant situation in several other countries. Because of certain distinguishing characteristics of the structure of the South African economy[23] this question has to be approached with great circumspection.

Finally, the concentration of economic power in South Africa was compared with that in several other countries.[24] Amongst these are countries like Australia and Canada, which, to some extent, find themselves in a position comparable to that of South Africa as regards the structure and circumstances of their economies. This gives some insight as to where South Africa stands internationally in respect of economic structure.

1.4 METHODOLOGY

In the following paragraphs a brief outline is given of the approach and methods used in compiling the various parts of this study. It also gives and indication of the main sources that were consulted.

In broad terms, this study consists of two main parts. The first part covers a literature study over a broad field of topics related to the concentration of economic power. The theoretical topics were chosen to tie up with the empirical discussion.

The second part presents the empirical analysis. The data were collected and presented to coincide with the objectives of this study as outlined in the previous paragraphs.

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22) See 3.3, page 86 of this study.

23) See 6.3, page 156 of this study. General remarks on South African industrial conditions.

24) See Chapter 10, of this study. International comparison of economic concentration.

1.4.1 Literature study

The first part of the literature study deals with the relationship between concentration of economic power and competition. Attempts made at defining pure competition, perfect competition and workable competition proved somewhat of a difficult task in the light of the numerous opinions on the subject.

This is followed by a discussion of the ways and means through which the accumulation of economic power can take place. The combination of firms, especially where the conglomerate company is involved, receives special attention.

The effect of economic power concentration is not always detrimental to society. The possible advantages of concentration as well as the possible disadvantages also receive attention. Flowing from the disadvantages are numerous restrictive trade practices which may disrupt normal economic behaviour. The most prevalent practices are defined and briefly discussed.

The identification of dominant firms for the purpose of competition policy receives some attention. This is supplemented by empirical data in an effort to determine a quantitative norm for such firms under South African conditions.

In an effort to select applicable measures for the compilation of concentration indices in this study, the most commonly applied measures of concentration are analysed, as well as information essential to their application.

Finally. serving as an introduction to the second part of this study, there is a short exposition of the historical development of the South African manufacturing industry.

1.4.2 Available data

It has been remarked that no representative study on economic concentration has as yet been done on the South African economy. This is due mainly to the lack of sufficient and relevant statistical data. Blair remarked in this regard: "At the present stage of world affairs, it is idle to dream about 'ideal' or 'perfect' measures which require for their construction entirely new masses of basic information."[25] Since he made this remark, there have been phenomenal advances in the field of computer science and vast amounts of information can nowadays be stored for tabulation by means of carefully constructed computer programmes.

Such data on the concentration of economic power are provided frequently by the Department of the Census of the United States of America. Even though such specific tabulations did not exist in South Africa at the commencement of this study it was possible to extract the relevant data with the collaboration of the Department of Statistics. Since the Department is bound by the secrecy clause of the Statistics Act, the tabulations and extracts thus made had to be adapted to comply with the requirements of the Act. The greatest problem that had to be overcome was the extraction of the data on a firm instead of an establishment basis, as normally presented by the Department of Statistics. As a result of this investigation the Department has expressed its intention of including some of the required data on a firm basis in their future statistical reports.

1.4.3 Classification of industries

Compiling an index that reflects concentration of economic power presents a fundamental problem of classification.

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25) Blair J.M., "Statistical measures of concentration in business. Problems of compiling and interpretation", Bulletin of the Oxford University Institute of Statistics, Vol. 18, 1956, p. 360.

Various classifications of industries, markets, sectors, commodities, etc., in the economy can be used. The one most commonly used, however, is the so-called Standard Industrial Classification of all Economic Activities, (SIC).[26] This classification is also used for the purpose of this study.[27]

1.4.4 Variables employed

Several variables can be used for compiling an index on the concentration of economic power. An index based on employment is most commonly used for the simple reason that employment data are the most readily available on a comparative basis. Employment, however, is not necessarily the most suitable variable since economic, technological and other factors can distort the relationship between economic power and employment. For this reason two other variables, namely turnover and fixed assets, are also used in this study. Turnover is considered to be the better of the two for reflecting economic power concentration since a firm can only achieve its aims after having sucessfully sold its products in the relevant market.

Various measures were used to process these variables for the relevant indices and structure indicators. The correlation between tne results of the tnree variables was determined and certain inferences were drawn as to the interpretation of each.

1.4.5 Analysis of wholesale and retail and construction

Since detailed analysis of the abovementioned industries as well as manufacturing is considered to be too lengthy

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26) See 1.2, page 8 of this study.

27) See 4.5, page 102 of this study: Classification of Industries.

to include in a single study, it was decided to present only a limited outline of the basic concentration data for these two industries.

1.4.6 Comparison of measures

Ten measures of economic concentration are employed to determine economic concentration.[28] They are compared as to the rank in economic concentration allocated to the various industries in terms of these measures. The statistical analysis of these rankings as well as the inferences to be drawn from the index by each measure are also compared with the findings of several overseas analysts on this aspect.

1.4.7 International comparison

Since many other countries compile concentration data according to SIC, an international comparison of certain manufacturing industries is made. This became possible because some of the indices developed in this study are comparable to those for several foreign countries.

1.5 CONCLUDING COMMENTS

The main purpose of this study is to determine the degree of concentration of economic power in the manufacturing industry of the South African economy. Most people concerned with the matter of concentration of economic power have at some time or other expressed an opinion on the extent of such concentration. For several reasons, however, it has not yet been possible to support such statements with statistical data. It is the actual proof of the concentration of economic power that this study has set out to provide.

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28) See 5.3, page 140 of this study: Measures of concentration of economic power employed in this study.

In the course of collecting and processing the relevant data it was possible to analyse several other related aspects as well.

Firstly, there is a vast array of measures that can be used to determine economic concentration. None of these has as yet been singled out as the superior measure. In the literature study extensive attention was given to this matter, outlining the best known measures as well as their advantages and disadvantages. Other aspects of the technique of concentration measurement were also discussed.

Secondly, finding reliable data, available for all the units in a classification, is a major international problem when compiling a concentration index. Since extensive data are collected for at least three variables, namely turnover, employment and fixed assets, it is possible to compare the results of these. This should prove valuable to future students on the subject, who will also be confronted by the problem of selecting a variable.

Thirdly, since ten different measures were used to compile the different concentration indices their results were also compared as to the inferences that could be drawn from each, thus classifying the measures as to their use.

Fourthly, an international comparison of economic concentration was drawn between the South African manufacturing industry and that of several other Western countries.

A definite shortcoming of this study, is that because of lack of relevant data over a reasonable period of time, the trend as regards the degree of concentration could unfortunately not be determined.

In considering the concentration of economic power, concepts describing market structure, such as monopoly and oligopoly, are inevitably encountered. Therefore their meaning and relevance to the subject of study will also be

elaborated upon, as much as is necessary for this study as well as the main advantages and disadvantages of the concentration of economic power.

Since the measurement of economic power concentration is such a controversial subject, the methodology of measurement of concentration was thoroughly investigated. Journals and periodicals such as "The American Economic Review," "The Yale Law Journal," "Bulletin of the Oxford University Institute of Statistics," "Journal of the American Statistical Association," "Journal of the Royal Statistical Society," and many others were consulted. Publications by noted authors such as Blair,[29] Bain,[30] Pickering,[31] and Rosenbluth,[32] to name but a few, were consulted in order to assess developments in the field of the measurement of economic concentration. From these publications the most commonly used measures have been selected and discussed as to their application, shortcomings and advantages.

Several attempts have already been made to distinguish the optimal, or best, measure for determining economic concentration. To date, however, no consensus has been reached in this regard. Until such time as a universally acceptable measure is developed, the majority of analysts will continue to use and adapt the existing measures to suit their available data and particular aims.

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29) Blair J.M., "Statistical Measures of Concentration in Business. Problems of Compiling and Interpretations," Bulletin of the Oxford University Institute of Statistics, Vol. 18, 1956.
Blair J.M., Economic Concentration : Structure, Behaviour and Public Policy, Harcourt Brace Jovannovich, Inc., New York, 1972.

30) Bain J.S., Industrial Organisation, Second Edition, John Wiley and Sons, Inc., New York, 1968.
Bain J.S., "Workable Competition in Oligopoly, Theoretical Considerations and some Empirical Evidence," American Economic Review, May 1950.

31) Pickering J.F., Industrial Structure and Market Conduct, The Pitman Press, Bath, 1974.

32) Rosenbluth G., Measures of Concentration, in: Business Concentration and Price Policy, NBER, Pinetown University Press, Pinetown .1955.
Rosenbluth G., Concentration in Canadian Manufacturing Industries, Pinetown University Press, Pinetown, 1957.

As a conclusion to the theoretical study and also as an introduction to the empirical study a brief exposition of the historical development and certain distinguishing characteristics of the South African economy is presented.

CHAPTER 2

THOUGHTS ON THE CONCENTRATION OF ECONOMIC POWER

2.1 INTRODUCTION

The concentration of economic power is a highly controversial subject, discussion of which raises topics such as the advantages and disadvangages of economic concentration, its influence on market structure and on competition, price policy, public and consumer interest, social resonsibility of the firm, and many others.

One point of view was summed up by the White House Task Force Report on Anti-trust Policy commissioned by the Johnson administration in 1968, which concluded that: "An impressive body of economic opinion and analysis support the judgment that this (the existing) degree of concentration precludes effective market competition and interferes with the optimum use of economic resources."[1] This point of view, with all the implications it has for other matters of economic interest, is mainly the one held by the protagonists for severe control and limitation of "big business" or excessive economic power.

The other viewpoint, usually held by the private sector and by those whose sympathies and interests lie with the businessman, is to some extent contained in the following views: "It is open season on corporate giants whose pricing policies are blamed for inflation. That allegation - like the facile equation of concentration and market power - rests on myth."[2]

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1) Preston L.E., "Is it time for industrial reorganisation?" California Management Review, Summer, 1974, Vol. XVI, No. 4, page 68.

2) "Economic Concentration: The Perennial Fall Guy," Monthly Economic Letter, First National City Bank, April 1972, page 12.

Concerning the public interest and economic concentration: "A more sophisticated definition of what is, and what is not, in the public interest is going to be required by the Board of Trade and the Monopolies Commission than the simple rule of thumb they have followed so far of monopoly = bad; competition = good, ..."[3)]

It is important that the protagonists for both points of view must be heard, since they represent all important sectors of the economy, namely the public sector, the private sector and the consumer.

A close examination of the many issues surrounding these points of view will show that each has merit and that a workable solution to the problems caused by economic concentration can only be found by considering all of them. In practice it has been the experience of the author that the exponents of the various points of view are often prejudiced in their attitude, to the detriment of healthy judgement.

It was established that the majority of the general public, the "silent majority", implicitly support the official attitude of a sharper surveilance of and action against unwarranted practices of big businesses. "Evidence shows that there has been a major decline in general public enthusiasm for 'big business' ...".[4)]

In this chapter it is attempted to point out the current schools of thought on the relevant aspects as well as to provide extensive references to sources for more detailed discussion of certain points. Matters discussed will include competition, the reasons why the concentration of economic power takes place, the role played by combinations

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3) "What's the Public Interest?" The Economist, August 19, 1967. p. 662.

4) Preston L.E., op. cit., p. 68.

in the concentration of economic power, the advantages and disadvantages of economic concentration, and the occurrence of restrictive trade practices arising from economic concentration.

2.2 THE CONCENTRATION OF ECONOMIC POWER AND COMPETITION

Formulation of an all-embracing definition or description of competition is a most difficult task since competition manifests itself in various forms and degrees.

Competition can be seen as refering to a buyer's or seller's prerogative to be able to choose between genuinely independent alternatives in the market. Interference with, or influencing of this prerogative is eventually manifested in one or more of the forms of competition, such as fair or unfair, aggressive or defensive, price or non-price, vertical or horizontal, etc.

The status and freedom of competition are also of the more important distinctions between the major economic systems of the world. The discussion of competition in these systems centres on the degree of concentration of economic power. "In carrying out the maxims of Marx and Lenin on size, the Soviet government has displayed a dedication verging on fanaticism, with the result that the Soviet economy has become the most concentrated in the world."[5] This reference, as well as the next, underlines the important link between economic concentration and competition: "... a fundamental factor that distinguishes these two kinds of economic systems (communist or socialist and capitalist) is whether comprehensive state planning or a competitive market price system is dominant in the functioning of the economy."[6]

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5) Blair J.M., op. cit., p. 682.

6) Richman B., "Implementing Competition Policy in Communist Countries", California Management Review, Summer, 1974, Vol. XVI, No. 4, p. 104.

The pure theory of communism has no place for competition in its economic system, but because of inefficiency, bottlenecks in production, disallocation of resources, and many other problems, communist leaders have come to realise that they must to some extent resort to more decentralised decision-making and to some kind of competition instead of centrally determined fixed prices and market planning.

Some communist states, such as Yugoslavia and others in Eastern Europe, already employ some kind of market socialism.[7] It is believed that the Soviet Union will also have to introduce much more overt competition and make more use of the genuine market mechanism if they wish to become more efficient and to achieve their non-profit economic goals.

While this tendency is revealing itself in the communist countries the contrary is being observed in advanced capitalist countries in that a greater degree of and need for state planning, regulation, resource allocation and wage and price control appear to be required. Even though there are reasons other than purely economic ones for these tendencies, the fact that an economic system in which the concept of free competition is the cornerstone does not function as desired, points to the possibility that the ideal system may be somewhere between these two extremes. In this regard Richman sums up as follows: "In reality, there are no pure Marxist or capitalist economies - it is a question of degree and extent. In both types of economies, however, the aim is to allocate and utilize resources in the most efficient ways in order to achieve desired explicit or implicit objectives, and to balance supply and demand in some workable way."[8]

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7) Richman B., op. cit., p. 104.

8) Ibid.

The future of the capitalist system was questioned by Charles Fourier as far back as 1808. He believed that because of competition "... small firms would be ousted by larger ones."[9] Nevertheless, competition, as a characteristic of the capitalist system, has withstood the test of time. Samuelson remarked in this respect: " ... a competitive system of markets and prices - whatever else it may be, however imperfectly it may function - is not a system of chaos and anarchy. There is in it a certain order and orderliness. It works.

Without a central intelligence it solves one of the most complex problems imaginable involving thousands of unknown variables and relations. Nobody designed it. It just evolved, and like human nature, it is changing, but at least it meets the first test of any social organization - it is able to survive."[10]

The marvel of this ability of the system to work was described as far back as 1776 by Adam Smith, in his well-known "Wealth of Nations", as the so-called "Invisible Hand." Accordingly, " ... every individual, in pursuing only his own selfish good, was led, as if by an invisible hand, to achieve the best good for all, so that any interference with free competition by government was almost certain to be injurious."[11]

The latter view may describe the basic truth about the system, but since then there have been so many far-reacing changes in most economic systems that the principles of a system of perfect competition sounds almost Utopian when measured against present conditions.

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9) Arndt H., "Basic Problems of Concentration Policy," The Anti-trust Bulletin, Vol. XVIII, Winter,1972, p. 1107.

10) Samuelson P.A., Economics : An Introductory Analysis, Sixth Edition, McGraw-Hill Book Co.,New York,1964,p. 37.

11) Smith A., An Inquiry Into the Nature and Causes of the Wealth of Nations, William Benton, Encyclopedia Brittannica Inc., London, 1952, p. 194.

The analysis of competition, against the background of economic concentration as presented in this study, is done in terms of the phases of competition distinguished by the Board of Trade and Industries Report on the Regulation of Monopolistic Conditions,[12] which was also adopted by Mouton.[13] These phases are: perfect competition, imperfect competition, and workable competition.

The questions regarding competition and competition policy considered by the Board in their Report are also relevant to this, and successive sections. These are: "How do monopolistic situations affect the welfare of the community, and are they important? What should be the general attitude of the state towards monopolistic tendencies? Finally, does economic theory provide the necessary criteria for implementing an anti-monopolistic policy, and, if so, what are these?"[14]

2.2.1 Perfect competition[15]

Perfect competition is often used synonymously with the concepts "pure competition" and sometimes "atomistic competi-

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12) Board of Trade and Industries, Report No. 327, 26 June 1951, The Government Printer, Pretoria, 1951, pp. 24 - 27. Any further reference to this Report will be indicated as BTI, Report No. 327.

13) Mouton D.J., The Behaviour of the Firm and the Problem of Restrictive Trade Practices, J.L. van Schaik, Ltd., Pretoria, 1974, p. 2.

14) BTI, Report No. 327, p. 24.

15) For detailed discussion consult the following: Samuelson P.A., op. cit., p. 472; Laden B.E., "Perfect Competition, Average Cost Pricing and the Price Equation," Review of Economics and Statistics, Vol. 54, 1972, pp. 84 - 88; Mouton D.J., op. cit., pp. 2 - 3; Haveman R.H. and Knopf K.A., The Market System, John Wiley and Sons, Inc., New York, p. 113; Kaplan A.D.H., Big Enterprise in a Competitive System, The Brookings Institution, Washington D.C., 1964, pp. 44 - 49; Singer E.M., op. cit., pp. 15 - 24; National Bureau of Economic Research, Special Conference series, Business Concentration and Price Policy, Princeton, 1955, pp. 119 - 123.

tion."[16] Singer outlined the characteristics of pure competition as "a market structure with the following features:[17]

(1) a large number of buyers and sellers,

(2) a standardized product,

(3) freedom of entry and exit,

(4) inability of any individual buyer or seller to influence price, and

(5) absence of any collusion."

In such a market no single firm has any control over prices, and both buyers and sellers have complete knowledge of market conditions and would immediately know of and act upon price discrepancies and changes in market conditions. The exact opposite of perfect competition would be pure monopoly.

In such a market prices of goods and services would thus be fixed by purely impersonal forces of supply and demand, because each producer would contribute so small a share to total supply and each buyer represent so little of total demand that they would be unable to influence prices.

The concentration of economic power would thus not be a feature of a perfect market situation. Irrespective of this aspect, the theory of pure competition provides no explanation for practical market situations or competition policy other than, on the one hand, describing one of the two extreme ends of the market and, on the other hand, pointing out many of the more important factors relevant to public interest.[18]

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16) Samuelson P.A., op. cit., p. 473.

17) Singer E.M., op. cit., p. 15.

18) Cf. Grether E.J., "Competition Policy in the United States Looking Ahead," California Management Review, Summer, 1974, Vol. XVI, No. 4, p. 63; Singer E.M., op. cit., pp. 22 - 24.

The main criticism of the theory of pure competition is, firstly, that it is unrealistic to presuppose that all market parties are fully informed about conditions of demand and supply.

Secondly, this is a static theory, whereas in reality the situation is one of dynamic change in which uncertainty becomes much more important. Under conditions of uncertainty one can expect combinations, and hence concentration, to increase in an effort by entrepreneurs to provide some kind of certainty and stability.

The market situation described in theory as imperfect competition, is discussed in the following paragraphs.

2.2.2 Imperfect competition

In its pure theoretical sence monopoly describes the extreme situation of imperfect competition, with only one firm active in a specific industry and no close substitute product in any other industry. Such exclusive monopolies are rare, even in the highly concentrated South African economy. Industries such as surface transport dominated by the South African Railways and Harbours, electricity supply by the Electricity Supply Commission, air transportation by the South African Airways, mail and telecommunication by the Department of Posts and Telecommunications and many others, are mainly under government control. They are nevertheless faced with competition and consequently cannot be classified under exclusive monopolies. From the data collected for this study only one industry was found in which only one firm operated, namely that for producing whale oil.[19] This firm - in fact the total industry - ceased production in 1973.

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19) See Appendix 5, page 2.

In the practical situation this points to the relatively small incidence of pure monopoly. Although many market structures are often described as monopolistic, this is mostly an inaccurate description of the real situation. In practice, the situation is most often one of"near monopoly," also called quasi-monopoly or oligopoly. What is mostly encountered - and South Africa is no exception[20] - is a market structure with only a "few sellers." It is the market power and subsequent behaviour of these few that become the object of economic analysis when considering and examining competition and economic conduct.

Samuelson distinguished two types of oligopolies.[21] In the first the oligopolist is one of a few sellers of an identical or almost identical, product or service. This is typical of the basic industries where products are reasonably homogeneous and the size of the firms or enterprises relatively large. In a market with such homogeneous products each of the few sellers can influence the market price to a large extent.

In the second type of oligopolistic market structure there are a few sellers selling differentiated rather than identical products.

Numerous examples of such industries can be found in the South African manufacturing industry.[22]

A fact that must be kept in mind regarding the South African situation is the inequality of the size distribution of firms in manufacturing. There are many industries in which the three or five largest firms are so large that they can be considered oligopolists. In no fewer than 105,

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20) See Table 9.4.1, page 242 of this study.

21) Samuelson P.A., op. cit., p. 475.

22) See Appendix 5 of this study as well as Mouton D.J.,"Die Oligopolistiese Markvorm en 'n Uiteensetting van Oligopolistiese Toestande in Enkele Suid Afrikaanse Bedryfstakke," Dissertation: M.Comm., University of Pretoria,1958.

or 58 per cent, of the 181 five-digit manufacturing industries,[23] the three largest firms in each industry control at least 50 per cent of the total turnover in that industry.[24]

The theory of imperfect competition regarding competition policy raises a twofold problem. Firstly, under the theories of pure competition and pure monopoly the results of economic behaviour are definite and distinct, whilst in a situation such as oligopoly, where the behaviour of each market party could affect the end result, the analysis of such a situation would have "to take on a wholly unmanageable burden of assumptions as to how each participant in the market would behave."[25]

Secondly, it is very difficult to develop the criteria necessary to distinguish between conditions and practices that can be condoned and those that are to be condemned.[26]

Because of these two shortcomings government action, or any other action, against the abuses that may arise from the concentration of economic power becomes virtually impossible.[27]

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23) See 4.5 page 102 for an explanation of the different situations in which the concept "industry" is used in this study.

24) See Table 9.3.1, page 237 of this study.

25) BTI Report No. 327, p. 26.

26) Cf. Papandreou A.G., "Market Structure and Monopoly Power," American Economic Review, 1949, pp. 883 et sec; Rothschild K.W., "The Degree of Monopoly," Economica, February, 1942, pp. 24 et seq.

27) Bain J.S., "Workable Competition in Oligopoly, Theoretical Considerations and some Empirical Evidence," American Economic Review, Papers and Proceedings, May 1950, p. 37.

2.2.3 Workable or effective competition.[28)]

The theory of effective or workable competition was originated by J.M. Clark.[29)] The Board of Trade and Industries Report gave a very clear précis of "what this school has to say on the question of the general results of actual competition. The theory of effective competition tries to show that actual competition, imperfect though it may be, generally functions satisfactorily. It is argued that, if a given number of conditions are required for perfect competition, and one or more of these are unfulfilled, the existence of the remaining conditions may become a positive detriment, and then a workable satisfactory result may depend on achieving some degree of imperfection in (these) factors."[30)]

The main requirements for a market situation of workable competition are:

Firstly, that it need not necessarily correspond to the theory of perfect competition other than including the essential elements of competition such as a free choice for buyers and the inability of sellers or groups of sellers to force their selling conditions onto buyers,

Secondly, that it must be practicable, and

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28) Cf. Clark J.M., "Towards a Concept of Workable Competition," American Economic Review, June 1940, pp. 241 - 256; Mouton D.J., op. cit., pp. 5 - 7; BTI Report 327 op cit., pp. 26 - 27; Grayson C.J., "Let's get back to the competitive market system," Harvard Business Review, Nov. - Dec., 1973, pp. 103 - 112; Preston L.E., op. cit., pp. 68 - 80; Jacoby N.H., "Antitrust or Pro-competition?" California Management Review, Summer, Vol. XVI, No. 4, pp. 60 - 67.

29) Clark J.M., op. cit., p. 241.

30) BTI Report, No. 327, p. 26.

Thirdly, that it must be reconcilable with the public interest.

Such a system will eliminate inefficient firms in any specific industry. Kaplan stressed the following market conditions as being conducive to effective competition:

"1. The number of buyers and sellers should be sufficent to provide a real and meaningful choice among alternative sources or outlets.

2. The position of any individual must not be so secure that he can dictate the conduct of others.

3. The position of any seller must not be so strong that the incentive to increase profits by reducing costs, altering prices, or improving product or service is materially reduced.

4. There must be opportunity for individual buyers and sellers to make decisions independently, without coercive pressure to join in agreements tending to restrict or narrow competition.

5. Entry or access to markets must not be hindered by deliberate restrictions or collusive measures, nor can the opportunities of individual buyers and sellers to act independently be hampered by private agreement.

6. There must be no discrimination among similarly situated buyers and sellers."[31)]

Analysts of competition and economic behaviour usually find that many of the above mentioned conditions are not

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31) Kaplan A.D.H., op. cit., pp. 46 - 47.

met in situations described as workable or efficient competition. Firms and enterprises where the concentration of economic power has taken place to a large extent are often accused of being responsible for causing this state of affairs.

This also points to the main problem areas encountered by officials and analysts concerning competition policy and market analysis namely, the identification of detrimental or undesirable market structures and the scrutiny of economic conduct where economic concentration has been identified. The former problem is treated as the main objective of this study. The latter part of the problem receives some attention at a later stage in this chapter whilst the problem of competition policy is dealt with in the next chapter.

2.3 WHY DOES THE CONCENTRATION OF ECONOMIC POWER TAKE PLACE?

There are several factors which may cause an increase of economic concentration. They are briefly:

(i) The increase in demand for the products of certain dominant firms in industries already highly concentrated, enable them to maintain or even increase their lead. South African industries where such dominant firms are found are the brewing industry; the glass and glass-products industry; instant breakfast foods; macaroni, vermicelli and spaghetti; matches; and many others.[32)]

(ii) Circumstances which make new entry into certain industries very difficult, if not virtually impossible. Some of these, which naturally benefit existing firms, comprise:

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32) This and similar observations are substantiated in the appendices to this study.

- consumer preference for brand names and trademarks of established dominant firms;
- cost advantages of firms already established and in the market;
- enormous investment required for new entry;
- control over raw materials, channels of distribution, technological know-how, patents and licences.

(iii) Restrictive trade practices, which are not being controlled very effectively in South Africa, entrench the advantage of being an established firm and even tend to increase this advantage. This feature, as well as undesirable structural aspects of some industries in the economy, constantly contribute to the further increase in economic concentration.

(iv) Protective measures such as tariff protection, which protect local industries from foreign competition, may lead to an increase in the concentration of economic power. In other instances some types of business such as, for instance agricultural co-operatives and regulatory control boards operating under the Marketing Act of 1968, are placed in a privileged position in that the Monopolies Act of 1955 does not apply to them in regard of the production and distribution of agricultural commodities which have not undergone a process of manufacture.

(v) The sustained high rate of inflation, as experienced lately, has the effect of entrenching the position of large firms against smaller ones and new firms wanting to enter a specific industry. Inflated prices are frequently too high for the latter to be able to procure plant and capacity.

(vi) Natural growth or internal expansion of the existing firm frequently leads to greater concentration of economic power. In this regard it is easier for larger firms with substantial economic power to increase this power, than for smaller firms which may still be contending for a viable place in that industry. It is often a matter of lack of financial resources.

(vii) Companies quoted on a stock exchange often accumulate economic power because of their desire to improve their market rating. Apart from internal growth this can also be achieved through combinations. Combinations, especially conglomorate combinations, have heen responsible for the greatest accumulation of economic power in the last two decades.[33)]

(viii) The size of markets, complexity of technology, low grade of mineral resources and the occurrence of unexploited countervailing power have all encouraged and in fact necessitated the concentration of economic power as manifested by the existence of very large enterprises.

(ix) Especially during a downward phase of the business cycle many firms, being unable to grow beyond a certain size, or experiencing financial difficulties, prefer to combine in some way or other rather than to stagnate or to be liquidated.

(x) South Africa is in need of considerable amounts of risk capital for investment purposes. In order to attract local and foreign capital on favourable terms, borrowers must be able to guarantee security of capital and interest. This can more easily be achieved through large and stable companies.

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33) See 2.3.1, page 33 of this study for a discussion of combinations and the concentration of economic power.

(xi) One of the main reasons for and advantages of economic concentration lies in the economies of scale and rationalization of management and control. The need and cost of intensive research and development can also be included but is usually a consequence of concentration rather than a cause of it.

(xii) Financial institutions such as insurance companies and banks frequently have surplus funds at their disposal which have to be invested. This may lead to the concentration of economic power through investment in and financial support of selected firms or groups.

(xiii) Legislation protecting patent holders[34] and licencing requirements for certain types of business, for example the liquor trade, grain milling, butcheries, and many others can cause economic concentration. Firms that do not have the patents or licences needed for conducting such business, or those wishing to expand, can obtain them either through the normal channels or by resorting to take-overs or mergers with existing firms already in possession of such rights. Mergers and combinations are often the only manner through which such goals can be achieved.

These are only some of the explanations for the concentration of economic power. They must also be examined in conjunction with the advantages and disadvantages of the concentration of economic power as discussed later in this chapter.

2.3.1 Combinations and the concentration of economic power.

There are mainly two ways in which the concentration of

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34) In South Africa the Patents Act No. 37 of 1952 applies.

economic power can take place, namely internal growth and combination. The latter refers to acquisitions, mergers and take-overs. Other, less frequent ways and means include power arising from patent rights, control over raw materials, licences and government regulation of the economic structure.

The extent to which the accumulation of economic power has already taken place in capitalistic economies has been the subject of discussion by numerous analysts, government officials, protagonists of consumer protection, and many others.[35)]

There seems to be general consensus that present levels of economic concentration will at least prevail for many years to come and in some cases may even rise.[36)]

Comment on the relative contributions of internal growth and combinations to the concentration of economic power could not be found in existing literature. However, it appears that mergers and take-overs play a predominant

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35) Cf. Nader, Ralph, ed. The Consumer and Corporate Accountability, Harcourt Brace Jovanovish, Inc., New York, 1973. For a comprehensive index on publications in this regard consult Marfels, C., "A guide to the Literature on the Measurement of Industrial Concentration in the Post-war Period", Zeitchrift für Nationalökonomie, No. 31, Springer-Verlag, 1971, pp. 492-506. Gratwick, J., Mergers, take-overs and social responsibility, Journal of General Management, Vol. 1, 1973, pp. 73-80; Mintz, M., and Cohen, J.S., America Inc. Who owns and Operates the United States, Pitman Publishing, Surrey, 1971; Stern, L.W., "Mergers under Scrutiny," Harvard Business Review, July-August,1969, p. 18.

36) Cf. Roberts, M., "The Concentration of Economic Power," American Federationist, May, 1975, pp. 8-13; Shepherd, W.G., "Trends of Concentration in American Manufacturing Industries, 1947-1958," The Review of Economics and Statistics, 46, 1964, pp. 200-212; George, K.D., "Changes in British Industrial Concentration, 1951-1958," Journal of Industrial Economics, Vol. 15,1967, pp. 200-211; Mueller, W.F., and Hamm, L.G., "Trends in Industrial Market Concentration, 1947 to 1970," The Review of Economics and Statistics, 1975, pp. 511-520.

role in corporate efforts to accumulate economic power.[37] This manner of external growth is often frowned upon by national governments. "With policy on most types of mergers set, the government is attacking the nebulous area of 'superconcentration'."[38] This comment suggests to some extent the official attitude in the United States regarding "excessive" growth through combinations. The following quotation emphasises the fact that a great need is being felt for the curtailment of concentration by means of legislation" ... the great increase in recent years of competition-destroying mergers, the damage to small business, the blighting of opportunity for our young people - all cry out for the enactment of legislation to stop the rising tide of monopoly."[39]

Competition legislation has in fact undergone dramatic changes as regards the powers granted to governments for regulation and control of competition in many countries.

Internal growth is usually determined by the expansion policy of a firm, following the successful conduct of business affairs. In the majority of cases it entails investment decisions of one kind or another. This is a field of study not directly related to the subject of this study and is therefore not pursued any further.[40]

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37) Cf. Utton, M.A., "The Effect of Mergers on Concentration: U.K. Manufacturing Industry, 1954-65," Journal of Industrial Economics, Vol. 20, Nov., 1971, pp. 42-57 "Conglomerates after the fall," Management, December, 1971, pp. 54-60; Beller, I., "Mergers and the concentration of economic power," American Federationist, October, 1966, pp. 8-15; Markham, J.W., "Survey of the Evidence Findings on Mergers," Business Concentration and Price Policy, Princeton University Press, New Jersey, 1955, pp. 141-212.

38) Tillman, R., "Rise of the Conglomerchant," Harvard Business Review, Nov.-Dec., 1971, pp. 44-51.

39) Markham, J.W., op. cit., p. 142.

40) For comprehensive information on the subject of internal growth and the investment decision, the following sources can be consulted: Lambrechts,I.J.,Kapitaalinvesteringsmetodes: Teorie en Praktyk soos toegepas deur 'n aantal vooraanstaande Suid-Afrikaanse Ondernemings, Thesis,University of Stellenbosch,1974; Reynders,H.J.J., red., Finansiële Bestuur,J.L. van Schaik Bpk.,Pretoria, 1974, pp. 257-293.

2.3.2 Combinations (acquisitions, mergers and take-overs)[41)]

In this section the main types of combination will be outlined.

The first is horizontal combination which takes place between firms producing an identical or similar product, which they sell in the same market. Combinations of this kind usually occur between either manufacturers or distributors in the same industry.

The second is vertical combination which takes place when a firm links up with a customer or a supplier rather than with a direct competitor.

The third is that of conglomerate combination which involves the combination of firms in unrelated industries and markets. This has been the more popular form of combination since the early sixties.[42)]

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41) The following sources regarding practical implications and techniques of combination are particularly revealing: Hovers, J., Expansion through acquisition, Business Books Ltd., London, 1974; Alberts, W.W., and Segall, J.E., (Ed.), The Corporate Merger, The University of Chicago Press, Chicago, 1969; Van Horne, J.C., Financial Management and Policy, Second Edition, Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1971; Merret, A.J., and Sykes, A., The Finance and Analysis of Capital Projects, Longmans, London, 1971; Harvey, J.L., and Newgarden, A., (Ed.), Management Guides to Mergers and Acquisitions, Wiley - Interscience, New York, 1969; Weinberg, M.A., Take-overs and Mergers, Third Edition, Sweet and Maxwell, London, 1971.

42) Cf. Beller, I., op. cit., p. 9; "Conglomerates after the fall," Management, December, 1971, pp. 54 - 60; Alexander, K.O., "Conglomerate mergers and collective bargaining," Industrial and Labour Relations Review, vol. 24, April, 1971, p. 355; Stern, L.W., op. cit. p. 19; Lintner, J., "Conglomerates and vertical responses to market imperfection," American Economic Association, pp. 101 - 111.

The conglomerate firm differs from other firms in that it does not have a clearly distinguishable main line of activity but is active in several different and unrelated industries.

This type of combination is also very popular in South Africa. One of many possible reasons is that, because of the nature of the mining industry, some of the mining houses in South Africa have a regular surplus cashflow that has to be reinvested. There are several reasons why reinvestment does not always flow back into the mining industry. One is that mineral reserves are a wasting asset. Once the mineral content of a mine is exhausted it has little value other than the scrap value of plant, machinery and property. This leads to the diversification of activities and investments by such financial institutions.

The same trend is noticeable in the financial sector where institutions such as insurance companies dispose of a substantial and regular inflow of cash from insurance premiums, which must be invested for the benefit of their policy holders. Such investments are then made in diverse branches of industry, in some of which substantial control is acquired.

Even in the banking sector the diversification of investments has become noticeable. Some of the largest banks in South Africa are known to have substantial investments in various manufacturing and mining industries.

Few business activities have caused more controversy, discontent and official outcry than that of conglomerate combinations during the past two decades. In the United States of America this movement has been under constant attack by government, aiming at its regulation and control[43)] to protect competition and the public interest.

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43) Singer, E.M., op.cit., pp. 242 - 269.

This has resulted largely from the increase in conglomerate combinations during this period. Blair points out that if the 200 largest companies in the United States in 1968 had not engaged in mergers, their share of total manufacturing assets would have increased from 42,4 per cent in 1947 to only 45,3 per cent in 1968, instead of to the actual 60,9 per cent.[44)]

The behaviour of the conglomerate firm and its effect on the economic system are really what is of interest as regards the concentration of economic power.[45)] In this regard Edwards remarks: "A concern that produces many products and operates across many markets need not regard a particular market as a separate unit for determining business policy and need not attempt to maximize its profits in the sale of each of its products as has been presupposed in our traditional scheme. It may classify its products into such categories as money making items, convenience goods and loss leaders, and may follow different policies in selling the different classes."[46)] This aspect enables the conglomerate firm to react differently from the single market firm.

Stern views this aspect as follows: "A multiproduct corporation can use resources generated in one market to 'outspend, out-dare and out-loose' one product rivals in another market. This thinking has led to the definition

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44) Blair, J.M., Economic Concentration, op. cit., p. 307. He also gives an exposition of the stages of conglomerate expansion on pages 293 - 307.

45) Cf. the following references for elaborate discussion in this regard: Blair, J.M., Economic Concentration, op. cit., pp. 41 - 58, 285 - 307; Alexander, K.O., op. cit., pp. 359 - 361; 362 - 365, 371 - 372. "Mergers or Conglomerates?" The Accountant, March 29, 1969, pp. 431 - 432; Gratwick, J., op. cit., pp. 76 - 80; Utton, M.A., op. cit., pp. 47 - 53; Tillman, R., op. cit., pp. 48 - 51.

46) Edwards, C.D., "Conglomerate Bigness as a source of power," in Business Concentration and price policy, Princeton University Press, Princeton, 1955, p. 332.

of conglomerate market power as the 'ability of a conglomerate firm at its discretion to shift marketing empahsis and resources among its markets and activities."[47] This modus operandi has established the combination movement, and especially conglomerate combinations, as being the greatest cause of economic concentration since the 1950's, which it will probably remain for many years to come.

Because of their influence on economic development, the economic justification and efficiency of combinations are constantly under scrutiny. According to Mintz and Cohen the executives of the "giant outfits" base the efficiency and right of existence of their firms on two rationales: "One, that bigness is synonymous with business efficiency. The other is that to be fully and properly exploited, modern technology requires giant corporations."[48] "They also rely on the concept of 'synergism'.[49] In brief, this means that the whole is greater than the sum of its parts - that two plus two equals five."[50]

These arguments and claims have been subjected to analysis and investigation resulting in many being found to be misleading and in some instances even untrue. The following are the conclusions of some analysts in this regard.[51]

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47) Stern, L.W., op. cit., pp. 28 - 30.

48) Mintz, M., and Cohen, J.S., op. cit., p. 41.

49) This concept and its relevance to the firm is extensively discussed by: Ansoff, H.I., Corporate Strategy, Penguin Books, McGraw-Hill, Suffolk, 1968, pp. 72 - 93.

50) Mintz, M., and Cohen, J.S., op. cit., p. 42.

51) Consult also: Gratwick, J., op. cit., pp. 73 - 80; Melicher, R.W., and Rush, D.F., "The Performance of Conglomerate firms: Recent Risk and Retutn Experience," The Journal of Finance, pp. 381 - 388.

"Although a growing percentage of resources are being devoted to this external method of growth, the clear-cut superiority of performance of merging firms has yet to be demonstrated."[52)]

Wittnebert found that " ... judged by the criterion of return on sales or that of return on equity, large corporations have suffered declining profit performance since 1960 ..."[53)]

Carroll[54)] found that regarding the conglomerate firm "This form of enterprise can 'succeed' only if it meets and survives the many challenges of growth and aging." He lists certain common characteristics of conglomerate firms which might lead to their downfall if they do not adapt to meet the challenges to this type of undertaking.

Research by Professor Bain[55)] showed that "economies of scale" can only be used as justification of "bigness" up to a certain point, after which no further economies emerge.

Sampson gave a detailed exposition of the undesirability of extreme "economic giantism" in his book about the In-

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52) Reid, S.R., "Is the merger the best way to grow?" Business Horisons, Vol. 12, Feb., 1969, pp. 41 - 50.

53) Wittnebert F.R., "Bigness versus profitability," Harvard Business Review, Jan. - Feb., 1970, p. 158.

54) Carrol, D.T., "What future for the conglomerate?", Harvard Business Review, May - June, 1969, p. 4.

55) Bain, J.S., "Economies of Scale, Concentration and the Conditions of Entry in Twenty Manufacturing Industries," American Economic Review, Vol. 44, March, 1954, pp. 15 - 39.

ternational Telephone and Telegraph Corporation in the United States.[56]

From the above it seems that what has been distinguished as being the most important means by which economic concentration is taking place, namely conglomerate combinations, is not always the best method for external growth.

Much of the criticism directed at economic concentration is also applicable to the combination movement. The following section on the advantages and disadvantages of concentration must therefore be considered together with section 2.3.

2.4 THE EFFECTS OF ECONOMIC CONCENTRATION

In this section an attempt is made to briefly evaluate the advantages and disadvantages of economic concentration.

2.4.1 Advantages of economic concentration

2.4.1.1 Economies of scale

A very popular argument supporting the advantages attributed to concentration of economic power is based on "economies of scale." This approach is supported by the concept of "synergy." Synergy in this sense implies that by adding together the efforts of formerly independent firms, a combined effect greater than the aggregate of their individual efforts can be achieved,[57] especially in the fields of administration, production, marketing, distribution, financial and managerial economies.

It must, however, also be kept in mind that there is an optimum level of "bigness" regarding production, finance,

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56) Sampson, A., The Sovereign State, The Secret History of I.T.T., Coronet Books, London, 1974.

57) Ansoff, H.I., op. cit., pp. 72 - 93.

management and concentration of economic power. This was pointed out, inter alia, by Meehan and Duchesneau and Bain.[58] Beyond this optimal point the maxim of economies of scale, or synergy, ceases to be valid and is replaced by the law of diminishing returns.[59] When the organisational structure of the "super giants" is analysed it becomes apparent that many of them have split into many independent firms with only ownership and group finance being centralised. This may imply that the concentration of all economic power is not always the most practicable.

The situation regarding optimum size in production and optimum span of management also merits mention. Bain[60] commented on optimum size and Mintz and Cohen on the optimum span of management. "As government and corporations grow larger, each becomes more difficult to manage. The top simply is too far removed from the middle and bottom tiers to permit effective use of personnel, equipment and planning processes."[61] Carroll referred to the conglomerate when he said " ... its chief executive officer in particular, gives far greater priority to acquisitions than to matters of internal administration."[62]

These points of view were tersely summed up by Robert Townsend when he remarked: "Excellence and bigness are incompatible."[63]

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58) Cf. Meehan, J.W., and Duchesneau, T.D., "The critical level of concentration. An empirical analysis," Journal of Industrial Economics, Vol. 22, Sept. 1973, p. 22; Bain, J.S., "Economies of Scale," op. cit., pp. 72 - 93.

59) An interesting exposition of this aspect is given by Blair, J.M., op. cit., pp. 92 - 95.

60) Bain, J.S., op. cit., pp. 72 - 93.

61) Mintz, M., and Cohen, F.S., op. cit., p. 41.

62) Carroll, D.T., op. cit., p. 4.

63) Townsend, R., Newsweek, March, 2, 1970, p. 61. He is also the author of the best-seller Up the Organization: How to stop the Corporation from Stifling People and Strangling Profits, Coronet Books, London, 1972; and former chairman of the Board of Avis.

Galbraith is not of the same opinion. With reference to the enormous size and diverse interests of the General Motors Corporation he remarked: "The size of General Motors is in the service not of monopoly or the economies of scale but of planning. And for this planning - there is no clear upper limit to the desirable size. It could be that the bigger the better."[64)]

His overt support of "bigness in business" is challenged by many.[65)]

It must also be pointed out with regard to the optimum span of management that spectacular development in the field of management information systems, aided by the introduction of computers and closed-circuit television, has greatly increased the optimum span of management.

It seems that economies of scale must in principle be seen as an advantage of size, and more specifically a consequence of economic concentration. It must also be borne in mind, however, that there is an optimum level of "bigness" regarding both production and management.

2.4.1.2 International competition[66)]

Of considerable importance for South Africa is the need for relative "bigness" in order to compete on international markets.

Under normal circumstances a firm must be of a certain size to be able to compete in price, quality, quantity and reliability in the international market.

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64) Galbraith, J.K., The New Industrial State, Penguin Books Ltd., Middlesex, 1970, p. 85.

65) Cf. Mintz, M., and Cohen, S.J., op. cit., pp. 21-23, 30-31, 43-44, 47, 53-54; Preston, L.E., op. cit., pp. 74-75; Blair, J.M., "Economic Concentration," op. cit., pp. 228 - 256.

66) The remarks of Preston, L.E., op. cit., p. 76, with regard to the American situation pertains.

South Africa's dependence on foreign trade is extremely high. In 1975 no less than 65,7 per cent of the gross national product, including gold, was involved in either import or export.[67] Almost 30 per cent of the GDP is being exported, which means that many South African companies are dealing in international markets in competition with companies on which South African economic policy has no influence. Even though a large share of these exports is contributed by gold and other minerals which are sold on commodity markets, the arguments for efficiency and economies of scale remain relevant.

Regarding imports, 35,7 per cent of the GDP is spent on the importation of goods and services. This could mean that several local firms are actively engaged in competition with foreign competitors in the local market. A fact which makes it easier for the local firms to compete with these foreign firms is that the size of South African firms is not limited by legislation. There are several other countries with economies also greatly dependent on foreign trade, that follow the same approach of non interference, or limited interference with the size of firms. The Netherlands host some of the largest companies in the world, such as Shell International Petroleum Ltd. and Mv. Philips Gloeilampen Fabrieken. Switzerland again has Nestlé, Ciba-Geigy Ltd., and the well known Swiss banks such as Union Bank of Switzerland and Swiss Bank Corporation.

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67) From: S.A. Reserve Bank, Quarterly Bulletin, No. 120, June, 1976, pp. 56 and 68:

Dependence on Foreign Trade 1975

	Exports (R'm)	Imports (R'm)
Merchandise	3618	6681
Net gold output	2540	-
Services	1306	2530
	7464	9211

Gross domestic product (GDP) at market prices R25771 million.

2.4.1.3 Research and development

There are basically two schools of thought regarding the relationship between research and development and economic concentration. The one is the belief in the superiority of large concentrated corporations such as found in monopolistic market structures. The other questions this excessive praise of "bigness" on the grounds of their failure to perform according to the claims made by their protagonists.

Of those supporting the first mentioned point of view Schumpeter,[68] Galbraith[69] and Lilienthal[70] are well known. Lilienthal remarked in support of "bigness": Only large enterprises are able to risk the formidable sums of money required to develop basic new departures; a small corporation is rarely abel to risk those large sums, perhaps enough to wreck the company if the gamble fails ... Bigness and research activity are largely synonymous ..."[71]

Of those challenging these claims Blair,[72] Wittnebert,[73] Bain,[74] Sampson,[75] Mintz and Cohen[76] are only a few among the many. Mintz and Cohen disagrees with Galbraith's claim that only large firms in modern industry are almost perfect instruments for inducing technical change and that "there is no more pleasant fiction than that technological change is the product of the matchless ingenuity of the small man forced by competition to employ his wit to better

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68) Schumpeter, J., Capitalism, Socialism and Democracy, Harper, 1942.

69) Galbraith, J.K., American Capitalism, the Concept of Countervailing Power, Houghton Mifflin, 1952. Ibid., The New Industrial State, op. cit.

70) Lilienthal, D.E., Big Business: A New Era, Harper,1952.

71) Ibid., pp. 69, 70.

72) Blair, J.M., Economic Concentration, op. cit.

73) Wittnebert, F.R., op. cit.

74) Bain, J.S., Economies of Scale, op. cit.

75) Sampson, A., op. cit.

76) Mintz and Cohen, J.S., op. cit.

his neighbour. Unhappily, it is a fiction. Technological development has long since, become the preserve of the scientist and the engineer"[77] They state the contrary, viz. that "the facts are preponderantly against the claim. Modern technology not only does not require giantism, but can actually be thwarted by it."[78] From an investigation into the origins of sixty inventions Stillerman noted that individual inventors were responsible for about one half of the major inventions.[79]

Quinn, a former executive of General Electric is quoted as saying: "I know of no original product invention, not even electric shavers or hearing aids, made by any of the giant laboratories or corporations ...

The record of the giants is one of moving in, buy out and absorbing the smaller concern."[80]

These are only a few examples of the numerous arguments and facts piled up against the equation of corporate "bigness" with new inventions and discoveries.

Justification for listing research and development as one of the advantages of economic concentration, despite all the contradictory evidence, is because advanced and costly research and development facilities provided by the larger concentrated firms can often not be afforded by smaller firms. The more facilities there are that provide opportunities for research and development, the greater the chance that more inventions will see the light.

2.4.1.4 Stimulation of entrepreneurial talent

Economic concentration, leading to rationalisation and

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77) Galbraith, J.K., The New Industrial State, op. cit., p.
78) Mintz and Cohen, J.S., op. cit., p. 47.
79) Ibid., p. 47.
80) Ibid., p. 44.

economies of scale, is in many respects the result of entrepreneurial genius and initiative. Should it happen that through the implementation of competition policy, or by any other means, undue restraint is placed on economic concentration, it will undoubtedly dampen such initiative and rationalisation, which might in the long run prove detrimental to the public interest.

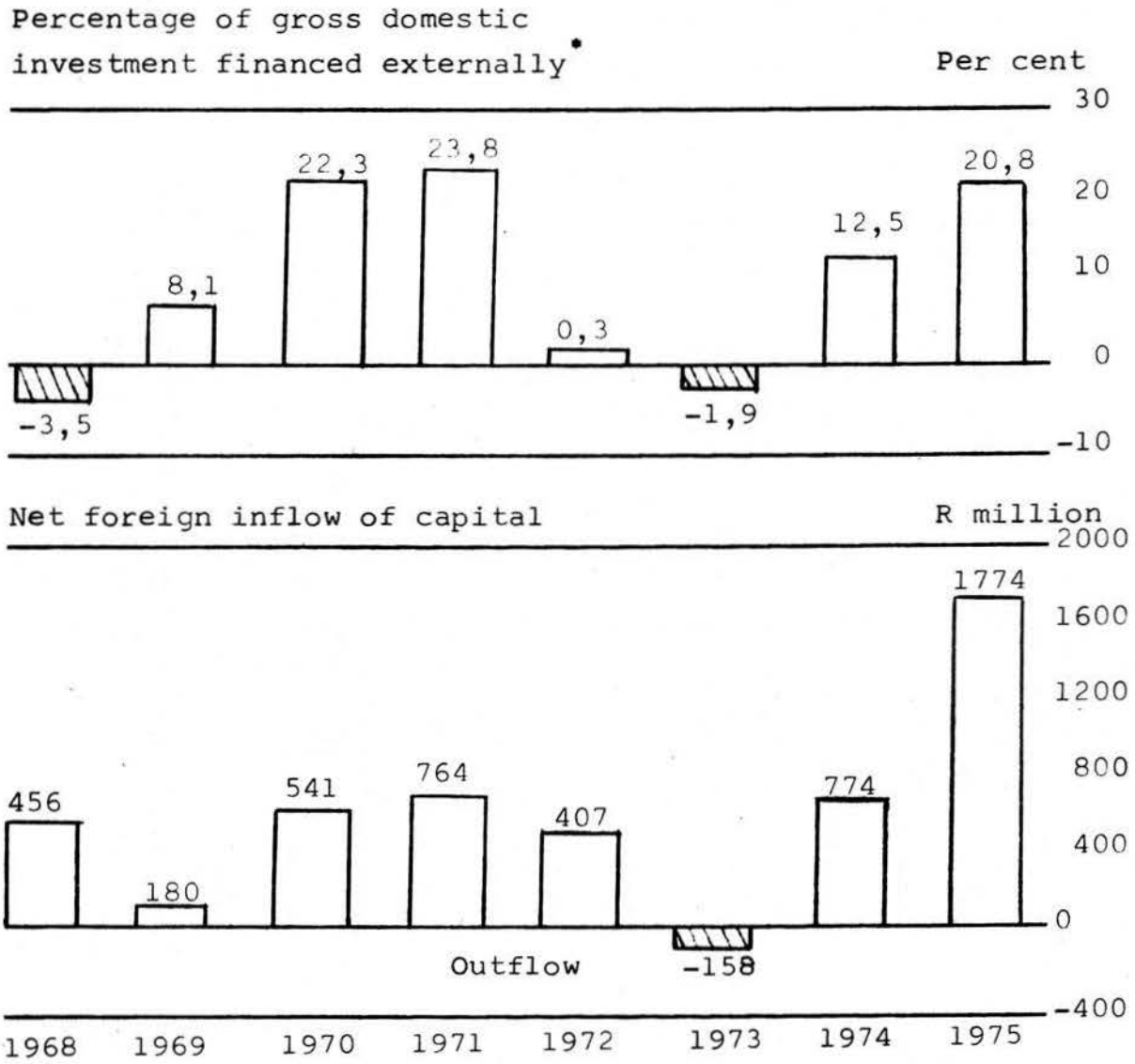
The profit motive is generally regarded as the strongest stimulant to private enterprise. Profit growth can be achieved through economic concentration. Should limitations be placed on the size that a firm may attain, it may very well affect initiative in private industry.

2.4.1.5 Securing investment capital and foreign loans

A characteristic which is not unique to the South African economy, but is certainly very important, is its dependence on foreign investment capital as illustrated by Graph 2.4.1.5.

The need to raise capital abroad has an important effect on the structure and organisation of South African industry. It is difficult, if not impossible, to raise money for a new business venture in the international financial market, especially when such a venture involves entry into an unfamiliar field of business or the use of a new process or technology. In the case of a relatively small venture the problem is overcome by the personal financial contribution of those who have confidence in the venture. There are, however, many kinds of business that cannot be started on a small scale. The mining of most minerals, steelworks, many types of chemical plant, paper mills or a large building complex are all cases in point.

Graph 2.4.1.5 : South Africa's Dependence on Foreign Capital[81)]



* including change in gold and other foreign reserves.

When finance has to be raised on forien markets the problem of finding a source can be acute. Foreign investors tend to be conservative when it comes to foreign investments, especially when they are not familiar with a new venture or the circumstances under which it is to be launched. Besides confining themselves to industries which they know well and associate with the country in question,

81) Compiled from data in South African Reserve Bank, Quarterly Bulletin, No. 120, June, 1976, p. 80.

(as with gold and diamonds in South Africa) they are also inclined to stay with companies whose names and reputations they know.

Therefore, the larger and better known South African firms are undoubtedly better placed to secure foreign capital. Besides being able to present a better image, they are also capable of providing more security.

2.4.1.6 Socio-economic considerations

Some of the advantages of economic concentration which also merit mentioning are those resulting from the role played by the firm in society. These advantages can be seen as the contribution of firms which becomes possible only after they have reached a certain level in size and profit.

Only firms of a substantial size are able to provide housing facilities and to subsidise the cost of housing of its employees. What used to be a benefit provided by government and semi-government bodies is now encountered more frequently in many large South African concerns.

A feature of many large concerns during the past decade or two has been an increased willingness to contribute to the protection and conservation of the environment. Projects of significant dimensions are not only supported but in many cases initiated and maintained by private concerns. The establishment of the Karoo Park Project and many other projects of environmental, historical, cultural and social interest can be attributed to private firms.

Apart from the fact that training is to some extent subsidised by the South African Government, many of the larger firms contribute to the training of their employees to a much greater extent than can be justified on purely economic grounds, i.e. besides the immediate economic

advantages they also endeavour to raise the general level of education and standard of living of their employees.

Other community services rendered by large concerns include the sponsorship of amateur sporting events, scholarships to universities, the provision of recreational facilities and many others. The advantages discussed here accrue to a large extent from the concentration of economic power.

2.4.1.7 Advantages of conglomerate concentration.[82)]

Economic concentration has a number of advantages that pertain specifically to conglomerate concentration. The following are listed:

Firstly, conglomerate concentration which enables the cross-pollination of industries where one can share in and benefit from the technical know-how and management expertise of the other, leading to improved technical and economic performance and perhaps even profitability.[83)]

Secondly, diversification of investments by means of which it is possible to spread risk and make the single firm less vulnerable to setbacks in a particular industry.[84)]

Thirdly, those firms with retained earnings in excess of their investment or expansion needs, or those having a large cash flow, often channel such funds into industries where they can be used profitably, thus stimulating industrial growth and development. It is also a means by which capital can be mobilised on a large scale.

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82) For detailed discussion of advantages consult: Tillman, R.,op.cit., pp. 45-48; Stern, L.W., op.cit., pp. 28-35; "Conglomerates after the fall". op.cit., pp.54-58; Beller, I., op.cit., p..10; Singer, E.M.,op.cit.,pp.260-266.

83) Ansoff, H.I., op.cit., p.119.

84) Ibid., p. 113-144 for reasons why firms diversify.

Fourthly, the conglomerate concentration of economic power enables the resulting enterprise to offer specialised services to all members of the group. Individual firms without the financial backing of a conglomerate often have to forfeit such services or obtain it from external sources at relatively high cost.

2.4.2 Disadvantages of economic concentration

2.4.2.1 Power to abuse

The concentration of economic power is usually manifested in monopolistic and oligopolistic market structures. This is when one firm, or only a few large ones are capable of influencing the price, production, distribution or any other aspect of some commodity or service because of some form of accumulated economic power. This influence may then be exerted by means of some kind of restrictive trade practice.

Mouton gives a detailed exposition of the principal influences and circumstances that often cause a firm to resort to restrictive trade practices.[85] He points out that the three main areas[86] where restrictive trade practices originate are market structure, market conduct and marketing channels. After an examination of these aspects he comes to the conclusion that restrictive trade practices are in fact a result of such a firm's reaction to the uncertainty and constantly changing environment in which it operates. He sums this up as follows: "In order to meet the contingencies arising from such changes, the firm has the discretion to choose between various alternative strategies, one of which is to resist change and attempt to maintain the balance with its environment by negotiations and agreements, which invariably leads to restrictive trade practices in the relevant industry."[87]

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85) Mouton, D.J., op. cit., pp. 23-29.

86) Ibid., p. 24.

87) Ibid., p. 28.

It does not necessarily follow that the mere possession of economic power always results in restrictive trade practices. This is one of the reasons why the present South African competition policy is aimed mainly at the control of market conduct and not of economic size per se.[88)]

The fact remains, however, that concentrated economic power creates the potential for the abuse of such power by its possessor. The fact that too much economic power can be vested in too few private hands should be a matter for public concern.

2.4.2.2 Economic concentration and inflation

A second disadvantage of economic concentration is suggested in the hypothesis of interrelationship between high concentration, inflationary prices and wage-price patterns. Solow remarked in this regard that "in our imperfect world there are important areas where market power is sufficiently concentrated that price and wage decisions are made with a significant amount of discretion. When times are reasonably good, that discretion may be exercised in ways that contribute to premature inflation".[89)] Preston is more explicit in his observation that: "The central idea is that the monopoly position that confers the power to raise prices above competitive levels in the first instance also confers power to pass on cost increases, to raise prices and profits in response to rising demand, and to maintain price and/or profit levels in recession."[90)]

Views on the connection between concentration and infla-

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88) Mouton, D.J., op. cit., pp. 246 - 249.

89) Solow, R., in Blair, J.M., op. cit., p. 627.

90) Preston, L.E., op. cit., p. 71.

tion were also expressed by Dalton,[91] Madden[92] and Galbraith,[93] while Houthakker[94] proposed a rather unique solution for the control of inflation, viz. that industries where effective competition prevails, should be excluded from official control.

2.4.2.3 Excessive monopoly profits

There are basically two divergent schools of thought on the matter of whether excessive profits result from economic concentration.

Jacoby feels that there is not such a direct association between concentration and enterprise profitability: "If (economic concentration and profits) are positively correlated, they would more likely reflect the lower costs and superior efficiency of large firms rather than their market power."[95]

Ornstein, on the other hand, found support for the traditional hypothesis " ... that as concentration increases, the likelihood of collusion increases, leading to higher profits in highly concentrated industries than in moderate or low concentrated industries."[96] For empirical proof of his point of view he states: "The latest known count found thirty-two tests of this hypothesis with thirty-one finding a weak but statistically significant positive

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91) Dalton, J.A., "Administered Inflation and Business Pricing: Another Look," The Review of Economics and Statistics, Vol. LV, No. 4, Nov. 1973, pp. 516-519.

92) Madden, C.H., "Controls or Competition - What's at Issue?", The Review of Economics and Statistics, Vol. 54, 1972, pp. 228-229; Ibid., "A Reply," Vol. 55, 1973, p. 524.

93) Galbraith, J.K., "Controls or Competition - What's at Issue?" A Comment, The Review of Economics and Statistics, Vol. 55, 1973, p. 524.

94) Houthakker, H.S., "Are Controls the Answer?", Review of Economics and Statistics, Vol. 54,1973,pp. 231-234.

95) Jacoby, N.H., "Antitrust or pro-competition," California Management Review,Summer,1974,Vol.XVI,No.4, p.57.

96) Ornstein, S.I., "Concentration and Profits," Journal of Business, Vol. 45, Oct., 1972, p. 519.

relationship between concentration and profits."[97] Extensive work was done in this regard by Bain,[98] who found a weak regression relationship between equity profit rates and concentration. His findings were later supported by many others, notably Qualls [99] and Meehan and Dunchesneau.[100] The latter two also made the interesting deduction that "... the relationship is discontinuous, that the critical level of concentration appears to be at 55% at the four-firm level and 70% at the eight-firm level, and that increased concentration beyond the critical levels does not appear to raise the level of profitability."[101]

That a positive relationship exists between high concentration and high profit levels was also accepted by the Economic Council of Canada in their investigations regarding the concentration of economic power.[102] The work done by these authors supports the inference that a positive relationship does exist between economic concentration and profitability.

2.4.2.4 National dependence on continuity

When the concentration of economic power is considered on a macro or national basis one very important feature arises which should cause most governments grave concern. This is that many of the larger corporations have become so large that their failure could mean economic setbacks for a very large section of the national economy. "The huge U.S. corporations have become such important centres of jobs and incomes that it (Government) dare not let one of them shut down or go out of business".[103] This dependence on the

97) Ornstein, S.I., op. cit., p. 519.

98) Bain, J.S., "Relation of Profit Rate to Industry Concentration, 1936-1940", Quarterly Journal of Economics, Aug., 1951, pp. 293-324.

99) Qualls, D., "Concentration, barriers to entry and long run economic profit margins", Journal of Industrial Economics, Vol. 20, April, 1972, pp. 146-158.

100) Meehan, J.W., and Duchesneau, T.D., op. cit., pp. 21-36.

101) Ibid., p. 22.

102) Economic Council of Canada, Interim Report on Competition Policy, July, 1969, The Queen's Printer, Ottowa, Canada, 1969, p. 80.

103) When companies ..., op. cit., p. 16.

well-being of such large institutions compel the government to protect and assist them in times of economic uncertainty and decline.

In turn, such assistance removes much of the flexibility from the economic system and provides a shelter for bad management and inefficient operation. As a further consequence such protection is usually inflationary, hampers the effective implementation of competition policy and prevents the natural functioning of the capitalistic system through which inefficient units are automatically eliminated.

Examples of such salvage operations are numerous. In the United States the Lockheed Aircraft Corporation was saved by a $250-million loan guarantee by Congress while the solution to the British Leyland Corporation's financial problems was nationalisation. Up to date the South African economy has not been faced with a dilemma of this magnitude. It is conceivable that the failure of a corporation of the size of the Anglo-American Corporation of South Africa in its entirety could have far-reaching consequences for the South African economy.

2.4.2.5 Inequality of distribution of power

Apart from the inequality of economic power distribution, concentration can also greatly influence the distribution of social and political power. When a single institution manages to concentrate significant economic power it is just possible that such power may also be used to exert political and social pressure for purposes other than the purely economic. The study of the concentration of economic power is therefore also of interest to the political scientist, especially with regard to the distribution of economic power among different social groups and economic interests. According to Rand, political economists define their science as "... the study of the management or direction or organisation or manipulation of a community's or nation's resources".[104]

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104) Rand, A., Capitalism : The Unknown Ideal, New American Library, New York, 1967, p. 12.

Lobbying of organisations representing sectional interests is also a common phenomenon in democratic systems, viz. the organisation of labour into labour unions, of industry into chambers of industry, of commerce into chambers of commerce and of various individual industries into trade associations. Their collective bargaining power can be sufficient to greatly manipulate economic policies and results or can even bring national governments to a fall.

2.4.2.6 "The Creative Backwardness of Bigness".[105]

"Bigness" is no guarantee for progress and development in the field of new inventions or a faster pace in technological development and innovation. According to Blair[106] "... the contribution of large corporations to technical progress has fallen far short of what would have been expected in view of their resources, their facilities, and their share of the market". This statement is supported by his discussion on the history of recent inventions in the most concentrated industries in America and Britain[107] and is also underlined by the findings of Beller:[108] "Nor are the largest firms the ones which invariably produce the greatest technological breakthroughs".

The reasons for the "creative backwardness" of the larger corporations can be found in a number of factors which are briefly discussed below. The specific factors and their influence on a particular firm would vary according to the circumstances of each firm.

Because of heavy financial investment in capital-intensive industries cases have already been identified and in fact exposed where large firms are reluctant to introduce, enhance or stimulate technological development. Some have even tried to prevent or delay such innovations from taking place[109] in an effort to protect their technology.

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105) Blair, J.M., Economic Concentration, op. cit., p. 228.

106) Ibid., p. 228.

107) Ibid., pp. 213-227.

108) Beller, I., op. cit., p. 12.

109) Blair, J.M., Economic Concentration, op.cit., p. 231.

When a new discovery or invention threatens to make the existing production process of a firm obsolete, such a firm is faced with a serious decision. It must either ignore the breakthrough and face the possibility of falling behind competitors, or it must introduce the new technology, usually at the price of a great capital investment and initial uncertainty.

It is when the large firms decide in favour of the former alternative that they can become an obstacle to technological development.

Complacency may also contribute to an attitude of indifference regarding technological advance. Why change the product, process or price when customers can be satisfied at a profitable return?

According to Blair a cost-reducing innovation in an oligopolistic industry stands a chance of adoption only if it enables the innovating oligopolist to introduce a price reduction unmatchable by his competitors, which is sufficient to offset the combined effect of its introduction and the lower revenues resulting from the price reduction.[110)]

Either protecting an older technology or being indifferent to technological advance is attributable not only to oligopolistic industries, but can take place wherever a high degree of economic concentration has taken place.

Because of complacency, and for other reasons of business strategy, it is also possible that firms possessing concentrated economic power may withhold or delay innovation because of underestimation of the demand for such a product or innovation. This is said to have been the reason for the delay in the introduction of power-steering in passenger cars and trucks as well as the automatic speed regulator for watches.[111)]

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110) Blair, J.M., Economic Concentration, op. cit., p. 233.

111) Ibid., pp. 236-237.

Due to the humdrum pace and intensity of modern business management it quite often happens that the inventor is neglected in industrial organisation and compensation. Blair gives an interesting exposition of the problems, other than inventing, that face the inventor in modern business.[112)]

Other factors mentioned by him which give rise to the backwardness of large enterprises are misdirection of research,[113)] the incompatibility of organisation and creativity[114)] and alternatives to corporate research.[115)]

2.4.2.7 Social and environmental influences

Large business enterprises very often affect a very wide range of issues in their process of decision-making and organisation of commerce and industry. Aspects such as pollution of the environment, aesthetic improvement of the community and matters such as health hazards and dangerous products fall to a large extent within the control of the enterprise itself. Society has, relatively, very little power to influence such decisions despite the fact that the decisions and actions taken by large corporations can have a substantial social impact. Successful business ventures can have a positive effect on society, but the contrary is also true.

It often takes nothing less than a social disaster to muster enough public support and government action to influence corporate decision-making.[116)] The accumulation of economic power can grow to such a level that issues such as consumerism, environmental protection, pollution, social responsibility and public interest can receive secondary status in the hierarchy of corporate decision-making.

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112) Blair, J.M., Economic Concentration, op.cit.,pp.238-241.

113) Ibid., pp. 241-243.

114) Ibid., pp. 243-245.

115) Ibid., pp. 252-254.

116) Theroux, P., "Tragic Torture of Minamata," Reader's Digest, August, 1976, pp. 138-142.

2.4.2.8 Creating barriers to new entry

Given the economic powers vested in monopolies, oligopolies and conglomerates it is possible to prevent or hamper new entry into their markets by various means such as control over raw materials, price undercutting, long-term agreements with suppliers and consumers, exclusive dealing arrangements, exclusive franchises or agencies, and many others.

Apart from these means of obstructing new entry, it is probably "moral persuasion" that has the greatest influence. By setting prices at or very close to competitive, and thus normal, profit levels, potential entrants may be discouraged and even prevented from entering at a profitable level. This is of course done only until the invasion of the market has been averted, whereafter the previous practices are most likely reverted to. Studies confirming this point were conducted by, inter alia, Bain,[117] Mann[118] and Qualls.[119]

This barring of new entry in an attempt to secure and protect their own is in the long run detrimental to the public and national interest.

2.4.2.9 Government intervention and control

The influence, extent and effect of antitrust legislation on private industry in the United States is an effective deterrent to the accumulators of economic power. The moment the natural process of competition in a capitalistic economy is disrupted, attempts by those affected

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117) Bain, J.S., Barriers to new competition, Harvard University Press, Cambridge, 1956.

118) Mann, H.M., "Seller concentration, barrier to new entry and rates of return in thirty industries, 1950 - 1960", The Review of Economics and Statistics, Aug., 1966, pp. 296-307.

119) Qualls, D., op. cit., pp. 146-158.

will unavoidably follow to restore the status quo. In a democratic system such attempts are then usually channelled through the political system, with government being the tool through which action takes place.

Since the "invisible hand" of Adam Smith is no longer capable of regulating supply, demand, and hence prices in the economic system, something else had to take its place to ensure orderly conduct and growth in the system. It is probably with this in mind that Richman remarked that " ... the advanced capitalist countries find that they have a greater need for state planning, resource allocations, and wage and price controls."[120)]

Since the private sector is not in a position to introduce and administer such controls in an impartial manner, the only institution left to do so is the government.

Much has already been said, and remains to be said, on the subject of state intervention and control. Outspoken protagonists of private industry in South Africa in this regard are Dr A. Wessels[122)] and Dr. A. Wassenaar.[123)] The articles by Jacoby,[124)] Preston[125)] and Grether[128)] are also relevant.

No matter what line of approach (pro or anti government intervention) is adopted by the various commentators on

120) Richman, B., op.cit., p. 105.

121) Numerous speeches and comments, inter alia two addresses delivered by him at the University of Stellenbosch on 18th February, 1974, and 20th August, 1975, entitled "Sluipende Sosialisme." (Creeping Socialism).

122) Wassenaar, A.D., Assault on Private Enterprise: The Freeway to Communism, Tafelberg Publishers Ltd., Cape Town, 1977.

123) Jacoby, N.H., op.cit., pp. 53-59.

124) Preston, L.E., op.cit., pp. 68-79.

125) Grether, E.T., "Competition Policy in the United States," California Management Review, Vol. XVI, 1974, pp. 60-67.

this subject, the fact remains that a certain minimum of governmental regulation and control appears to be essential for the operation of our more or less capitalistically orientated economies. The need for intervention was to a certain extent brought about by the private sector making itself guilty of the abuse of economic power and malpractices to the detriment of public and national interest. In the absence of governmental control, the larger enterprises could perform some kind of controlling or regulating function, but in such a manner that it conforms to and serves their own aims and objects.

2.4.2.10 Disadvantages of conglomerate concentration

As with the advantages, there are certain disadvantages of economic concentration that pertain particularly to conglomerate concentration, although the other types of concentration may also be involved. Some of these disadvantages are pointed out in the following paragraphs.

The first complaint against conglomerates is the effect of such concentration on the market conduct of the enterprise. Potential competition is reduced in that a conglomerate buys into an industry or market rather than adding to the existing capacity by the creation of a new competitive unit. Whereas internal growth would have contributed to the number of competitive units, conglomerate combination does not reduce competition but impairs its extension.

A further complaint is the so-called "deep pocket" advantages of conglomerates. This is described by Pickering as the fact that: " ... a firm's power in (its) market is greater than that represented by its market share alone and so the controlling impact of market forces is weakened where diversified firms have freedom in redistributing their resources between activities."[126] This boils down

126) Pickering, J.F., op.cit., p. 141.

to the fact that they are able to subsidise their activities in a specific market in an effort to strengthen their hold in that market, by making use of their accumulated economic power.[127] They are thus able to engage in cut-throat price competition, intensive advertising campaigns and various other means by which they can weaken their competitors and also prevent or discourage new entry.

Conglomerates are also accused of indulging in agreements of reciprocity.[128] Under such arrangements one large firm buys from another large firm with the explicit or implicit understanding that the favour will be returned. Such dealings automatically cut out other competitors in the market and lead to a lessening in overall competition.

A common complaint against conglomerates is their contribution to overall or macro economic concentration. This refers not to concentration in a specific industry but in the economy as a whole, i.e. the concentration of macro economic power, viz. total assets, employment, wealth, etc., in the hands of relatively few corporations. Although not of concern regarding restrictive trade practices in a specific industry, it does have implications for the distribution of social and political power.

A final common complaint against conglomerate concentration vests in their employment of questionable financing and

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127) Cf. Blair, J.M., Economic Concentration, op. cit., p. 141; Kaplan, A.D.H., op.cit., p. 214; Alexander, K.O., op.cit., p. 358.

128) Cf. Singer, E.M., op. cit., pp. 220-223; Alexander, K.O., op. cit., p. 358; Edwards, C.D., "Conglomerate Bigness as a Source of Power," in Business Concentration and Price Policy, pp. 342-345; Blair, J.M., Economic Concentration, op. cit., pp. 367-369.

accounting techniques.[129]

Blair attribute the growth of conglomerates to some extent to the fact that their employment " ... of questionable accounting techniques whose use has been approved by the accounting profession but whose effect, if not purpose, has been to mislead investors by maximizing apparent earnings resulting from an acquisition while minimizing apparent cost."[130] In this regard the main culprit seems to be the "manipulation" of the price-earnings ratio in a legitimate but often misleading manner.[131]

2.5 RESTRICTIVE TRADE PRACTICES

Any institution, enterprise, firm, manufacturer, trader, association, distributor or person that indulges in some form of restrictive trade practice can do so only when in possession of and/or backed by some form of concen-

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129) Blair, J.M., Economic Concentration, op.cit., pp. 291-298. Weston, J.F., "The determination of share exchange ratios in mergers," in Alberts, W.W., and Segall, J.E. (Ed.), op.cit., pp. 117-138; Pickering, J.F., op. cit., p. 141.

130) Blair, J.M., Economic Concentration, op. cit., p. 291.

131) Ibid., p. 293-298; Lambrechts, I.J. "Kombinasievorming," in Reynders, H.J.J. (Ed.), op.cit., pp. 391-393.

trated economic power. Concentrated economic power can take on various forms, be it patent rights, market control by monopoly or oligopoly, control over strategic raw materials, production capacity, distribution channels, technological expertise, support by the members of an industry, or any other manner that allows some entity to regulate or influence the activities of others in the production or distribution and pricing process.

As stated in Chapter One the measurement of the concentration of economic power in terms of control over turnover, employment and fixed assets is the main objective of this study. It therefore follows that the possible consequences of such power concentrations in the economy should also receive some attention in a study of this nature. An authoritative work on South African conditions in this regard is that of Dr. D.J. Mouton.[132] Due to his experience, first as a senior executive in the Department of Industries and later as member of the Board of Trade and Industries where he is directly involved in and responsible for the application of official policy and control of such activities, he has intimate knowledge of restrictive trade practices and official policy in South Africa. To elaborate on his presentation would require a study confined to this issue. However, for the purpose of this study, the main types of restrictive trade practices are defined, and illustrated with local examples where possible.

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132) Mouton, D.J., op.cit., pp. 32-80 and 245-277.

With regard to the identification and definition of activities deemed restrictive to competition, the South African legislation gives a comprehensive description of what is regarded as constituting a monopolistic condition, or a condition to which the Monopolies Act applies. This description contains all the elements required to describe a restriction of competition.[133] In terms of the Monopolies Act a restrictive trade practice can be defined as " ... every agreement, arrangement or understanding, whether legally enforceable or not, between two or more persons; every business practice or method of trading, including any method of fixing prices; every act or omission on the part of any person, whether acting independently or in concert with any other person; and every situation arising out of the activities of any person or class or group of persons, which has the effect of directly or indirectly restricting competition." [134]

The word "person" in the definition is used in its wider legal sense to include associations, enterprises, companies, firms, or any other form of business.

In his discussion of restrictive trade practices, Mouton grouped them according to the four major decision-making areas in the undertaking, which is where they usually originate and where their consequences are primarily felt. These are the areas of production, distribution, promotion and prices. The same classification is used in the following discussion.

2.5.1 Production

Restrictive trade practices aimed at regulating the market share of firms and based on production become relatively more important during periods of adverse economic conditions.

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133) Mouton, D.J., op. cit., p. 33.

134) Regulation of Monopolistic Conditions Act, No.24 of 1955, Section 2.

The scramble for a relatively smaller market during such adverse conditions could easily lead to severe price competition, to the detriment of all the firms concerned. In times of prosperity, with expanding markets, the endeavour is to prevent individual firms from expanding their individual share of the larger market beyond their relative production capacity and at the expense of their competitors. Besides mutual agreements, through which production in a specific industry or market can be regulated to the benefit of all the firms, individual firms or groups of firms may also enter into agreements or practices through which they can protect or expand their own market shares against potential new entrants or existing competitors.

The following are some of the more important restrictive trade practices aimed at achieving the above-mentioned goals:

2.5.1.1 Prescribed production quotas

Production quotas are usually determined by mutual agreement and administered by trade associations. Accordingly, each firm is assigned a prescribed quantity or quota for the production of a commodity, which, if not adhered to, makes that firm liable to the payment of a fine or even denial of continued membership of the association.

2.5.1.2 Extension or reduction of capacity

In the endeavour to regulate the market share on some agreed basis, agreements may be entered into which call for the understanding not to construct additional capacity, or even be taken so far as to result in the collective buying out and closing down of existing capacity.

2.5.1.3 Prescriptions relating to product

In an effort to avoid non-price competition, producers of the same or similar types of products may resort to

measures such as uniform standards of production. This practice was found to be employed by the Biscuit Manufacturers Association in South Africa.[135]

2.5.1.4 Pre-emption of production facilities

"Pre-emption of production facilities consists of the acquisition of, or an agreement to acquire, scarce productive facilities and the withholding of these from non-participants to the agreement, or of making them available to such non-participants only upon discriminatory terms."[136] This practice is common in cases of vertical integration or where a single firm, or only a few firms, are allowed to erect such production facilities. This is the situation in South Africa where only one or, at the most, only a few plants can supply the local market economically, as for instance a nitrogen plant for the manufacture of fertilizer.

2.5.1.5 Restrictions arising from patents, trade marks and copyrights

Even though patents, trade marks and copyrights are legal rights protecting their owners' rights to their products, they also bestow upon their owners considerable bargaining power, enabling them to include restrictions on production and distribution agreements for these products and services.

2.5.2 Distribution

Restrictive trade practices in the field of distribution are primarily aimed at the regulation of the competitive behaviour of the firms in the industry concerned. Such practices are often administered through trade associations which try to eliminate or minimize price competition in

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135) Board of Trade and Industries, Report No. 437(M).

136) Mouton, D.J., op. cit., p. 35.

their members' markets. Consequently, these practices are usually related to some scheme of fixing prices, resulting from direct agreements and negotiations between the relevant parties.

2.5.2.1 Allocation agreements by mutual consent

Where several firms are competing in the same market, with the same type of product, they often consent to allocation agreements in an effort to lessen or regulate competition. Accordingly, there are numerous types of agreements of this nature by which products, services, purchases, sales, markets or customers can be divided or allocated.

2.5.2.2 Sales quotas

In industries where products or services are distributed by or under the supervision of a strong network of trade associations or sales cartels, sales quotas are often agreed upon and allocated to the different firms in an effort to regulate competition.

2.5.2.3 Restriction of accessibility

In an effort to protect the competitive position of certain firms in a particular market, they may agree upon certain measures by which new entry into that market is prevented or through which the activities of the firms are regulated by limiting access to certain services, products, suppliers, markets, etc.

2.5.2.4 Boycott action as a measure of intimidation

Through boycott action the firm or firms concerned collectively agree to discriminate against a firm or firms not conforming to their arrangements or policies. By withholding supplies or purchases from such a firm or firms they hope to exert enough pressure to persuade them to fall in line with their collective decisions and policies.

2.5.2.5 Approved customers list

Under this practice, which often occurs in industries with well-organised trade associations, goods are supplied only to customers whose names appear on an agreed list. Apart from being an effective measure for enforcing other restrictive trade practices it also enables suppliers to select distributors according to their requirements of service to be rendered, status of outlets, equipment and expertise of the outlets handling their products.

2.5.2.6 Discriminatory practices

There are numerous methods employed in practice through which suppliers can differentiate between their customers. Through these practices, such as refusal to sell to one while selling to another, refusing membership of a trade association, refusing credit and other facilities, and many other devices, all the customers for that type of product or service are not given equal competitive opportunities regarding the supply of products.

Practices of this nature were encountered in inter alia, the biscuit, cigarette, bicycle and bicycle spare parts, sugar, matches, whisky and other imported liquor industries in South Africa.[137)]

2.5.2.7 Exclusive dealing arrangement

Agreements of this nature usually mean that two or more parties arrange to deal exclusively with each other, or only with those forming part of the agreement. Thus the buyer undertakes to buy only from the supplier, while the supplier sells only to them and not to others. Reciprocity is always a characteristic of such agreements. This practice is usually administered through the trade associations[138)] in that industry and is particularly effective in restricting new entry.

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137) Board of Trade and Industries, Report Nos. 437 (m); 465 (m); 489 (m); 940 (m) and 1071 (m).

138) See Board of Trade and Industries, Report 437 (m), par. 36 - 37.

2.5.2.8 Exclusive agencies or franchises

In an effort to regulate competition, suppliers often grant the exclusive rights to distribute their products to one dealer, usually in a demarcated geographical area. This area may vary from the entire country to a single street block, depending on the product. The restriction in trade vests in the fact that competitors are not granted an equal footing in obtaining the product from the suppliers. It may mean that some dealers are totally excluded from handling that product or, if they want to sell it, have to buy it from their competitor, who has the franchise or agency in that particular area.

2.5.2.9 Prescribed uniform conditions of sale

Where parties have agreed on the selling prices of goods they frequently also adopt comprehensive regulations regarding the conditions of reselling. This is to ensure that their price agreement is not undermined by indirect means of price competition such as discounts, samples, gifts, allowance for returned goods or containers, and many others. The adoption of such uniform conditions of sale almost completely prevent normal competition from taking place.

2.5.2.10 Tying arrangements

When a purchaser, lessee or licensee of an article, service, patent or technology can get the right to buy, lease or manufacture the article, only if he purchases other articles [139] or services, sometimes not even complementary to the desired one, then other firms competing in similar products are prevented from competing for the patronage of that particular buyer or lessee. It may also mean that where a buyer is dependent on that main article, patent, lease or licence, he is unable to purchase complementary or ancillary articles of his own free choice which may better serve his purpose or might even be of a better quality at lower prices.

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139) Dunlop's Rules, op. cit., p. 716. "The company also requires retailers who sign its agreement to carry a full range of its products ..."

2.5.2.11 Refusal to sell

Every supplier has an autonomous right to supply to whom he prefers, according to his own distribution policy. By this right he may thus refuse to sell to a particular firm.

The refusal to sell in consequence of other agreements, such as exclusive dealing, boycotts, franchising and price fixing, must be distinguished from refusal to sell because of the seller's right to do so.

2.5.2.12 Coercion or threats of intended action

In an attempt to ensure the co-operation of a firm or groups of firms in complying with certain trade practices or policies, powerful firms or groups of firms may threaten to make use of their economic power to intimidate them if they do not comply willingly. Such threats can then be implemented by means of any of the practices discussed in this section.

2.5.3 Restrictions arising from promotion policy

In an effort to eliminate competition between firms through restrictive trade practices, promotion by the affected firms of the goods involved must also be controlled. Failure to do so enables those firms to create a preference for their products by means of promotion, which in turn leads to competition. Provision for the restriction of promotion is usually spelled out as part of the agreements regarding restrictions on production, distribution and prices, since aiming at the restriction of promotion in general would serve little purpose.

2.5.3.1 Restriction of advertising

In order to ensure equal competition between certain firms or members of a trade association, they are usually ex-

pected to observe uniform and standardised advertising policies. These prescriptions regarding advertising can be aimed at the defining of the forms of advertising to be used, such as free gifts, samples, exhibitions and catalogues; or the type of publications allowed, such as general newspapers, technical periodicals or prestige journals; or the type of media to be used, such as publications, radio, television, sign boards and so forth.[140)]

2.5.3.2 Sign board prescriptions

Trade associations in the professional and semi-professional fields usually prescribe the size, shape and nature of signboards displayed by members of their associations to indicate premises. This is done in an attempt to prevent one member from luring customers from another by means of a larger or more persuasive sign board.

2.5.3.3 Denial of advertising space

It may also happen that associations deny advertising space to non-members of their associations in technical journals and publications controlled by them.

2.5.4 Restrictions regarding price policy

Restrictive trade practices regarding price policy are usually aimed at restricting the freedom of one or more firms active in a particular industry, or selling a certain product, to determine their selling prices as they wish. This is perhaps the restrictive trade practice most frequently indulged in and of the greatest importance to the consumer since it directly influences the prices paid in the retail trade.

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140) Cf. Board of Trade and Industries, Report No. 437 (m) Where the giving of free gifts was prohibited and other special offers controlled; Dunlop's Rules, op. cit., p. 716 prescribing media: " ... retailers must not advertise selling prices for our major branded products through mass media."

2.5.4.1 Resale price maintenance

Resale price maintenance includes every arrangement, understanding, agreement or method of trading which deprives a reseller of the right and freedom to fix his own resale prices. Such price fixing can be done on an individual basis, as was the case with S.A. Philips (Pty.) Ltd.,[141] or on a collective basis, when more than one party in the distribution process agrees to prescribe and maintain certain prices.

The essence of every resale price maintenance practice is that the reseller is not free to determine his own reselling prices and that the supplier endeavours to maintain the prices he had prescribed.[142]

2.5.4.2 Guide prices or recommended prices

The fact that guide prices or recommended prices are furnished on a voluntary compliance basis for the convenience and guidance of the reseller and that he may determine his reselling prices at his own discretion, distinguishes them from resale price maintenance practices. In practice, however, it can happen that suggested prices have the same ultimate effect as prescribed prices. This occurs when the small reseller handles a large variety

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141) South African Philips was found guilty of withholding supplies of television sets during 1975 from retailers who were not prepared to maintain Philips' retail selling prices. The company was fined R20 000 and some of its executives received fines totalling R15 000 as well as suspended jail sentences.

142) In an effort to prevent price cutting of its products Dunlop required clients to sign an agreement whereby they must " ... carry a full range of its products as well as those of competitors; to have separate sports departments staffed with experts; provide service for sports goods; to pay within the required time, and not to transfer Dunlop goods to outlets which do not comply with the rules." Dunlop's Rules, op. cit., p. 716.

of small items, as in the case of a corner grocery store or a small chemist shop, where shopkeepers do not have the time to calculate their prices for all their items. It may also occur where the individual trader or distributor enjoys a monopoly, as in the case of a general dealer in the countryside, who has no competition and thus no incentive to lower his prices below those suggested by his supplier.

2.5.4.3 Price change reporting agreements

In an effort to eliminate price competition, firms in the same line of business may agree to report all proposed or introduced price changes or changes regarding rebates, discounts and other terms of sale. Because most participating competitors will usually follow such price changes reported to them, this practice can have the same effect as a formal price agreement.

2.5.4.4 Horizontal price agreements

In this instance the suppliers of the same or similar types of products agree to conform to a similar pricing policy in an effort to eliminate price competition on a horizontal basis. This type of agreement was found in several manufacturing industries in South Africa tending toward oligopoly, such as tyres and tubes, petrol, biscuits, bricks and cement, and several others.[143)]

2.5.4.5 Predatory price cutting

The practice of predatory price cutting, in contrast to loss leader selling, is not aimed at attracting custom but at the elimination of competition. Once such competition has been removed the practice is usually discontinued.

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143) See Board of Trade and Industries, Reports No. 465 (m); 489 (m); 606 (m); and 1020 (m).

2.5.4.6 Collusive tendering

This practice, also known as collective bidding or level tendering, is aimed at the elimination of competition between competitors who have agreed to the scheme. It can be accomplished through various schemes such as rotation of bids or tenders, cover prices, or refraining from tendering or bidding.

In an in-depth inquiry the "Financial Mail" uncovered such an "immoral practice" in which " ... some furniture removal firms are cushioning competition by rigging tender prices."[144] Many of these firms operate this scheme of cover prices while under the umbrella of the South African Furniture Removers and Warehousemen's Association.

In addition to the above, Mouton describes several other lesser known types of restrictive trade practices based on price decisions encountered in practice.[145]

2.6 SYNOPSIS

This chapter suggests a direct relationship between competition and the concentration of economic power. Because of the latter, a market or industry can be structured as being monopolistic, oligopolistic or competitive. The recognition of such market structures is very important in a more or less capitalistic system for purposes of economic and political policy. Competition policy aimed at regulating restrictive trade practices is based on the analysis made of concentration of economic power.

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144) "Uncovering a costly scandal", Financial Mail, October 1, 1976, pp. 27 - 31.
"Shoe industry: Footing the bill", Financial Mail, 24 September, 1976, p. 1141.
The 35 factories under the umbrella of the Footwear Manufacturers Association, representing approximately 70 per cent of South Africa's annual shoe production, have indicated their intention to increase the price of shoes made from genuine leather.

145) Mouton, D.J., op. cit., pp. 44 - 47.

It has also been pointed out that many arguments can be presented in the defence and condemnation of the concentration of economic power. As will be seen in the next chapter, monopoly and oligopoly situations are not considered undesirable per se in the Republic of South Africa. In fact, in many instances the occurrence of large concentrations of economic power in the economy is regarded as inevitable and in the public interest. This, however, implies that government must be fully aware of and in control of restrictive trade practices that can follow from concentrated economic power. These potential restrictions of competition have been pointed out; the effectiveness of their control will receive attention in the next chapter.

The combination of firms, as against internal growth, is by far the most important cause of economic concentration. In this category the conglomerate merger is responsible for the greatest accumulation of economic power. However, there is growing disillusionment amongst laymen, theorists and entrepreneurs about the advantages originally attributed to this type of external growth.

In the following chapter the identification of a "dominant firm" in terms of competition policy receives attention.

CHAPTER 3

IDENTIFICATION OF "DOMINANT" FIRMS FOR PURPOSES OF COMPETITION POLICY IN SEVERAL COUNTRIES.

3.1 INTRODUCTION

There are basically two distinct approaches to the identification of firms considered to be dominant in their particular industries. Such domination may result in uncompetitive behaviour, or in competition considered detrimental to the public interest.

One approach is to stipulate, by way of legislation, a predetermined percentage of market dominance, which will immediately indicate at what stage a specific firm, or group of firms, attains a **de facto** dominant position.

The other approach is to concentrate on the market conduct of the firm, and to infer from this whether or not economic power is abused. Such abuse may be manifested in restrictive trade practices stemming from excessive or dominant economic power.

In consequence of the difference between these two basic approaches, legal concepts such as "dominant firm" and "market dominating enterprise" are interpreted differently in the legislation of most countries. To furnish a comprehensive survey in this regard would require an independent study focused solely on this issue. For the purpose of this study, this chapter will therefore merely review the laws applicable in various countries, indicating their interpretation of this problematical aspect of competition policy.

The reason for the difference in approach to matters of competition policy is explained as follows by Jacobs: "Unlike other fields of law which may originate from generally accepted common principles, competition laws reflect the particular political, economic and social concepts of each country and although there has developed a considerable amount of agreement as to what restrictive business practices may be harmful, attitudes vary considerably as to how they should be controlled and hence the machinery for control differs widely from country

to country."[1)]

Competition legislation is very dynamic, necessitating periodic review and adaptation of existing laws and regulations. This stems from the increase in knowledge of the behaviour of firms, of the influence of economic structure on conduct, and of the effect of competition laws and requirements regarding the public interest. Evidence of this continuous review of and change in competition policy is found in recent legislation and important amendments concerning competition policy in various countries such as Australia, Canada, New Zealand, West Germany, the United Kingdom and Israel. A report by the Commission of Inquiry into the Regulation of Monopolistic Conditions Act of 1955 in South Africa was also completed in 1977. For this reason the exposition provided in this chapter should be seen, at the most, as representative of the status quo at this point in time in the countries mentioned.

A new awareness of the importance of the structure of industries in the framing of competition policy is displayed by the attempts to define,or at least describe,a situation regarded as dominant in most legislation introduced recently. This awareness stems from the realisation that there is a close link between market structure and competitive behaviour.

It is significant that, with the exception of the United States, none of the countries that have introduced the concept of dominant firms into their legislation has provided for the per se prohibition of a dominant position. Even in cases where a dominant position can be identified in terms of the law, it is actually the abuse of such a dominant position, or conduct of the dominant firm or firms, that may bring them within the ambit of the law.

It is against this background that this survey of the identification clauses in the legislation of some of the more or less capitalistic countries should be seen. Since the present South African Monopolies Act does not provide for the identification of a "dominant firm" on a quantitative basis, some of the identification clauses outlined for the other countries have been applied to the local economic structure.

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1) Jacobs, D.M., "Some Developments and Differences in the Operation of Competition Laws," International Lawyer,Vol. 8, no. 3, p. 544.

3.2 IDENTIFICATION OF DOMINANT FIRMS IN SEVERAL COUNTRIES.

3.2.1 United Kingdom

Inquiry into the existence and effects of monopolistic situations started in 1948 with the Monopolies and Restrictive Practices (Inquiry and Control) Act.[2] In this Act a monopoly was described as a situation where the dominant firm or group of firms concerned, controlled at least one-third of the production or market of the goods in question. This Act was amended and supplemented by several others until the present Fair Trading Act of 1973 was promulgated.

The latter Act defines a monopolistic situation as follows:

> "For the purposes of this Act a monopoly situation shall be taken to exist in relation to the supply of goods of any description in the following cases, that is to say, if
>
> (a) at least one-quarter of all goods of that description ... are supplied by one and the same person ...
>
> (b) at least one-quarter of all the goods of that description ... are supplied by members of one and the same group of inter-connected bodies corporate, ..."[3]

The above are only guidelines for the identification of monopolistic situations. In the application of the Act it is the actual conduct of the dominant firm or firms that is important. In this regard a market share of 89 percent by the dominant firm was ruled as not against the public interest because "of an outstanding record of efficiency and technical development, together with an absence of artificial barriers to the entry or growth of new competitors".[4]

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2) BTI Report No. 327, par. 31, p. 10.

3) Guide to legislation on Restrictive Business Practices, Europe and North America, Volume III, United Kingdom 1.6, Section 6, p. 5.

4) Gribbin, J.D., "Recent Antitrust Developments in the United Kingdom," Antitrust Bulletin, Summer 1975, Vol. XX, p. 385.

3.2.2 Austria

The Cartels Act of 22 November, 1972, reads as follows:

"(1) An enterprise shall be deemed to dominate the market within the meaning of this Federal Act,

1. if, in respect of certain goods or services, it is exposed to no competition or to insignificant competition, or

2. if its share of the total domestic market exceeds 50% and:

(a) the entire domestic market is supplied by no more than two or three enterprises, or

(b) it is among the four largest enterprises, which conjointly account for at least 80% of the total domestic market." 5)

3.2.3 Australia

The Trade Practices Act 1974, of Australia reads as follows:

"(3) For the purposes of this section, a reference to a corporation being in a position substantially to control a market for goods or services includes a reference to a corporation which, by reason of its share of the market, or of its share of the market combined with availability of technical knowledge, raw materials or capital, has the power to determine the prices, or control the production or distribution, of a substantial part of the goods or services in that market". 6)

3.2.4 Belgium

The Belgian Act of 27 May, 1960, on Protection Against the Abuse of Economic Power reads as follows:

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5) Guide..., op.cit., Volume 1, Austria 1.0,Section 40,page 16.
6) Ibid., Volume 1, Austria 1.0, Section 46, page 20.

"Article 1. For the purpose of this Act, economic power shall mean the power possessed by a natural person or body corporate ... acting in concert to exert, ... through industrial, commercial, agricultural or financial activities, a dominating influence over supplies of merchandise or capital, the market, or over the price or quality of specific merchandise or services."[7)]

3.2.5 Spain

The Spanish Act against Restraints of Competition of 20 July, 1963, reads as follows:

"7. All agreements for the concentration of enterprises must be registered in the Final Register within a month of the date on which they were concluded if by reason of such agreements the enterprises parties thereto acquire control of 30 percent or more of the national market in a given product or service, or if one of the enterprises included in the concentration already previously controlled such a percentage of the market."[8)]

3.2.6 France

The French Price Ordinance of 30 June, 1945, reads as follows:

"The activities of an enterprise or group of enterprises holding on the home market a dominant position that is characterised by a monopoly situation or by manifest concentration of economic power, where such activities have the object or may have the effect of interfering with the normal operation of the market shall be prohibited ..."[9)]

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7) **Guide**, Vol. 1, Belgium 1.0, Article 1, page 1.

8) **Ibid.**, Vol. 11, Spain 1.0, Section 7, pp. 10 - 11.

9) Ibid., Vol. 111, France 1.0, Article 59 bis, p. 3.

3.2.7 Germany

The German Act against Restraints of Competition of 27 July, 1957, reads as follows:

"(3) It shall be presumed that

1. an enterprise is market dominating ..., if it has a market share of at least one-third for a certain type of goods or commercial services, this presumption shall not apply when the enterprise recorded a turnover of less than D.M. 250 million in the last completed business year;

2. The conditions are met if, in regard to a certain type of goods or commercial services,

   (a) three or less enterprises have a combined market share of 50% or over, or

   (b) five or less enterprises have a combined market share of two-thirds or over ..." [10)]

3.2.8 United States of America

The United States relies on mainly three acts, namely The Sherman Act of 1890, The Clayton Act of 1914 and the Federal Trade Commission Act of 1914, to ensure free and fair competition in private enterprise as the basic regulator of most economic activity.

Under these Acts, monopoly situations are said to occur where a predominant share of the market falls into the hands of one, or a few, corporations. Attempts to quantify this description were made in the Neal Report[11)] where oligopolistic industries were defined as, " ... relevant economic markets with (a) more than $500 million in annual sales, (b) four-firm

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10) Guide ..., op. cit., Vol.11,Germany 1.0,Section 22, p. 12.
11) Preston, L.E., op. cit., p. 69.

concentration of 70 per cent or more, and (c) the same four firms retaining leading market positions over time". A maximum permissible market share of 12 percent for any individual firm was envisaged.

Senator Hart suggested an Industrial Reorganisation Act in 1972 in which he defined monopoly as existing when "(a) the corporate rate of return on net worth after taxes is above 15 percent over a substantial time period; (b) 'there has been no substantial price competition'; or (c) four-firm concentration amounts to 50 percent or more. Monopoly power as so defined shall not, however, be unlawful if it can be shown to be due to valid patents or scale economies".[12)]

Julian Simon suggested a graduated corporate income tax to reduce corporate "bigness" without directly taking into account market share or monopoly power. He recommended that " ... the current (tax) rate of approximately 50 percent of taxable earnings be retained for corporations in the $25 000 - $80 000 bracket, and stepwise increases applied above that level to a peak of 75 per cent on earnings above $1 billion."[13)]

Despite these suggestions for antitrust purposes every case is still being treated on an ad hoc basis entailing some measure of economic concentration to determine market dominance.

3.2.9 Republic of South Africa[14)]

Until 1955 South Africa had no effective legislation concerning the regulation and control of monopolistic conditions or restrictive trade practices. Existing legislation,

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12) Preston, L.E., op. cit., p. 69.

13) Ibid., p. 70.

14) For a detailed discussion of the development of competition policy in South Africa, see Cowen, C.V., "A Survey of the Law Relating to the Control of Monopoly in South Africa", The South African Journal of Economics, June, 1950, pp.124-147; Report of the Commission of Inquiry into the Regulation of Monopolistic Conditions Act., 1955, The Government Printer, Pretoria, March, 1977, chapters one and four; BTI Report No. 327, chapter five.

compiled for other purposes, was used in an attempt to regulate such practices when they occurred. In this regard Cowen remarked: "The failure of the criminal branch of our law to control monopoly, put the whole burden of protecting the public upon the civil or private branches, namely the law of contract, and, to a lesser extent, the law of tort or delict. Experience has proved, however, that this is a task which these branches of the law are not fitted to bear. Indeed, the net effect of the civil law is to facilitate the path of the monopolist, and to leave the interests of the general public very much in the air."[15)]

This state of affairs continued until 1943, when the Minister of Economic Affairs issued a directive whereby the BTI was instructed to investigate " ... the effects of manufacturers' or distributors' associations, combinations and monopolistic tendencies on production, distribution, market demand and/or consumers' prices."[16)] As an interim measure the Undue Restraint of Trade Act, No. 59 of 1949, was passed pending the report of the Board. The Board consequently completed its Report No. 327 in April, 1951, upon which the present monopolies Act, known as the Regulation of Monopolistic Conditions Act, No. 24 of 1955, was promulgated in March, 1955. The Undue Restraint of Trade Act of 1949 was repealed and since then only a few minor amendments have been introduced to the present Act.

A major shortcoming of this Act is that it is only an enabling measure which cannot be contravened by any person or undertaking because it does not prohibit anything. It only provides the machinery whereby any suspected monopolistic condition or conduct can be investigated from the point of view of whether it is against the public interest or not.

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15) Cowen, D.V., op. cit., p. 132.

16) BTI Report No. 327, par. 1, p. 5.

The approach of the Act concerning the concentration of economic power is not to condemn such concentration. Accumulated economic power, or the size of firms, does not form part of the definition of a monopolistic condition. The main emphasis is placed on the abuse of such concentrated power through the restriction of competition.[17] Therefore the Act contains no per se prohibition on the size of a firm but is aimed at the regulation of the conduct of parties in the market.[18]

The Minister of Economic Affairs is the only person who can issue a directive in terms of section 3 of this Act, whereupon an investigation of a suspected monopolistic condition can be launched. Having received such a directive, the BTI conducts an investigation and reports back to the Minister, who has to make the final decision on whether to prohibit or condone the condition. Depending on his decision, he may act in terms of several options contained in section 6 of the Act.

However, despite this machinery available for the control of Monopolistic conditions, relatively little use is being made of it. Only 18 investigations have been ordered by the Minister since the inception of the Act of 1955.[19] Resulting from one of these investigations the practice of resale price maintenance was found not justified in the public interest and prohibited according to section 6(5) of the Act.[20] Even this outright prohibition has led to only four convictions[21] in court during the 10 years since the prohibition of resale price maintenance became effective. The report of the Commission of Inquiry was completed in March, 1977. In this

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17) **Monopolies** Act, op. cit., section 2.

18) This attitude is elaborated upon in Dutkiewicz, E., "Marketing Implications of Legislation Affecting the Regulation of Channels of Distribution", NDMF Conference, 25 June, 1975.

19) Report of the Commission of Inquiry into the Regulation of Monopolistic Conditions Act, 1955, p. 25.

20) Government Notice no. R.1150, G.G. 28 June, 1968.

21) Report of the Commission of Inquiry, op. cit., p. 23.

report several recommendations are made for a new approach to competition policy in South Africa.[22] Spandau is of the opinion that " ... the Government is now planning a new initiative against restrictive trade practices."[23]

Depending on the reaction of Parliament to this Report, South Africa may get more effective legislation and machinery for dealing with monopolistic conditions and competition policy in the near future. Since the Commission made no recommendation regarding the introduction of a quantitative measure for the identification of an undue concentration of economic power, it is doubtful whether such an aid will be included in any new legislation.

3.3 APPLYING LIMITATIONS ON THE SIZE OF THE LARGEST FIRM IN AN INDUSTRY FOR THE PURPOSE OF COMPETITION POLICY

Table 3.3.1 presents the distribution of economic power of the largest firm in each of the 181 South African manufacturing and 40 wholesale and retail industries, as classified on a five-digit industry basis. The intervals indicating the control of the largest firm in each industry have been determined so as best to illustrate the influence of the foreign definitions of firm size on South African industries. This table indicates the dominance of only the largest firm in each industry. The possibility of collusion between firms and their combined influence are not taken into account. From this table it can be seen, by way of illustration that in 25 manufacturing industries, does the largest firm in each industry control not more than nine per cent of turnover.

Table 3.3.2 indicates the number of South African five-digit industries that would qualify for official investigation under the competition legislation of the United Kingdom and West Germany if their size limitations were applicable in South Africa.

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22) Report of the Commission of Inquiry, op.cit., chapter VI.

23) Spandau, A., "Marketing Implications of Legislation affecting the Regulation of Monopolistic Methods," NDMF CONFERENCE, 25 June, 1975.

Table 3.3: Distribution of the economic power of the largest firm, based on several variables, in the 181 manufacturing and 40 wholesale and retail industries in South Africa in 1972.

	Manufacturing						Wholesale and Retail	
	Turnover		Employment		Fixed Assets		Turnover	
Percentage of industry controlled by the largest firm	No. of firms; each representing an industry	% of total industries	No. of firms; each representing an industry	% of total industries	No. of firms; each representing an industry	% of total industries	No. of firms each representing an industry	% of total industries
0 - 9	25	13,8	43	23,9	44	24,4	22	55,0
10 - 19	39	21,5	37	20,4	39	21,5	7	17,5
20 - 24	29	16,0	19	10,5	11	6,1	3	7,5
25 - 32	20	11,0	29	16,0	18	9,9	4	10,0
33 - 39	13	7,2	10	5,5	19	10,5	1	2,5
40 - 49	18	9,9	18	9,9	12	6,6	0	0
50 - 59	15	8,3	4	2,2	13	7,2	2	5,0
60 - 69	5	2,8	6	3,3	8	4,4	1	2,5
70 - 79	6	3,3	8	4,4	8	4,4	0	0
80 - 89	6	3,3	5	2,8	4	2,2	0	0
90 - 100	5	2,8	2	1,1	5	2,8	0	0
	181	100,0	181	100,0	181	100,0	40	100,0

* Source: See footnote one, page 165.

Table 3.3.2: Applying British and West German size demarcations indicating dominance of the largest firm in an industry to the South African manufacturing and wholesale and retail industries.

	United Kingdom Share of the largest firm (25% +)		West Germany Share of the largest firm ($33\frac{1}{3}$% +)	
	No. of firms each representing an industry.	% of total number of industries	No. of firms each representing an industry.	% of total number of industries
Manufacturing				
Turnover	88	48,6	68	37,8
Employment	82	45,2	53	29,3
Fixed Assets	87	48,0	69	38,1
Wholesale and Retail				
Turnover	8	20,0	4	10,0

Judged in terms of legislation in the United Kingdom it thus seems that on the basis of turnover 88 industries, or 48,6 per cent of all manufacturing industries. are open to immediate official investigation. Based on employment and fixed assets, 82 industries, or 45,2 per cent, and 87 industries, or 48,0 per cent of the total, respectively, would fall in this category.

In West German legislation the limitation on firm size is more lenient. Nevertheless, on the basis of the three variables, the numbers of industries falling within the demarcation are still relatively high at 68, 53 and 69, respectively.

The situation in wholesale and retail is that only 8 and 4 of the total number of industries are liable to investigation.

Having regard to the structure of the South African economy and the special circumstances prevailing in it, as discussed in later chapters, the question of a quantitative parameter for market dominance requires careful consideration. Even at a 50 per cent cut-off point in terms of all three variables, 37, 25 and 38 industries, respectively, are liable for immediate investigation. If this limit is made too high, however, it would mean that in many industries firms in a position to abuse economic power will not be identified.

It is therefore important to keep in mind that the philosophy of the South African legislation is not to condemn economic size per se but only undesirable conduct stemming from the abuse of economic power. A size definition with a cut-off point of either 25 or 33,3 per cent could thus serve the purpose of identifying those industries in which the largest firms are capable of abusing their economic power. Firms which possess more than the prescribed percentage of dominance but which operate in a responsible manner, conducive to the public and national interest must be tolerated, especially when judged against the South African background.

3.4 SYNOPSIS

It is generally accepted that a strong link exists between industry structure, or the concentration of economic power, and the economic conduct of firms. Even though the South African economy is strongly permeated with monopolistic and oligopolistic elements[24] there does not seem to be a general awareness of the dangers of a legislative system which tolerates the unhindered concentration of economic power and therefore creates the potential for numerous kinds of restrictive trade practices.

South African competition legislation adheres to the principle that the concentration of economic power is not to be condemned per se. The official approach is that it is the conduct of the firms possessing this economic power that

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24) See 9.4, page 241 of this study.

should be scrutinised. Only where this behaviour is found to be detrimental to the public interest can action be taken to dissolve, undo or limit such concentration. The consequence of this policy is that many monopolies and oligopolies, in South Africa, especially in the manufacturing industry, are safely outside the ambit of the legislation for the regulation of monopolistic conditions, provided their behaviour does not give rise to the creation of a monopolistic condition as defined in the Act.

Internationally the control of economic power concentration is becoming a highly contentious aspect of competition policy. Several countries have in recent years introduced updated monopoly legislation. An important feature of this revised legislation are the attempts made to better define a situation deemed to constitute a monopolistic or olipolistic condition. Some countries have even gone so far as to introduce quantitative limits on the size of firms in their definitions. South African legislation is still an exception in that no attempt is made in the Monopolies Act to quantitatively define a monopolistic or oligopolistic condition.

In an effort to investigate the consequences of the introduction of a quantifying clause in a new Act, the quantitative definitions employed in identifying a monopolistic situation in the United Kingdom and in West Germany were imposed on South African concentration data as a hypothetical exercise. In Table 3.2.2 it was showed that based on turnover, almost 50 per cent of all manufacturing industries and 20 per cent of all wholesale and retail industries are liable for immediate investigation under this assumption. This, however, need not necessarily be what will happen in practice, since it is not economic size, but economic conduct that would activate government investigation.

The introduction of a quantitative measure for the identification of a monopolistic situation in a new Monopolies Act can, therefore, only serve as an aid to the application of the Act since it would never be the sole criterion for initiating investigation, but will be employed only for identification purposes.

CHAPTER 4

MEASURES [1] OF CONCENTRATION ON ECONOMIC POWER

4.1 INTRODUCTION

A great variety of measures have already been developed for the measurement of economic concentration. Frequent attempts are made to improve on existing measures and also to develop new ones. However, no ideal, or at least generally accepted measure, without one or more of many possobile shortcomings, has as yet been developed. Consequently, there is a large array of measures, each with a number of followers. This inconsistency inhibits international comparisons of concentration data and the synchronising of research on matters of economic concentration.

It is not the aim for this study to improve of any existing measure, nor to come up with a new measure. Without going into detailed and complex mathematical discussion, an attempt is made to distinguish the basic measures of concentration in such a manner as to explain their application, the data they require, the interpretations of their results and their advantages and disadvantages.

4.2 WHAT IS A MEASURE OF CONCENTRATION ?

Before dividing the various measures into broad categories, the following extracts are presented to show the difference of opinion on what a measure of concentration should portray or what it is used for. It will be seen from the following, that each author has his own interpretation. A. and I. Horowitz see it as:[2] " ... a measure of the degree of disorder, uncertainty, or randomness in a system."

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1) In the terminology used for the determination of economic concentration a measure refers to a method or technique used to determine concentration.

2) Horowitz, A. and I., "Entropy, Markov processes and competition in the brewing industry", Journal of Industrial Economics, 1967/68, p. 196.

Finkelstein and Friedberg considers it as:[3] " ... relating the number and sizes of firms in a market to the degree of competition anticipated for that market."

Hall and Tideman state that:[4] "Measures of concentration are used to answer cross sectional questions concerning the variation in concentration among industries in a given time period, time series questions concerning changes in concentration in a particular industry over time and questions that incorporate both time series and cross sectional information." To comply with this definition they also list six properties that a measure of concentration should have.

Bailey and Boyle found that:[5] "Arguments over the type of measure of concentration which can be best used to portray (a) the structure of an industry (b), the structural differences between industries, and (c) differences which occur in the structure of an industry (or industries) through time, have been carried on for almost 25 years."

Kilpatrick concludes that:[6] "A measure will be judged a more accurate indicator of market power as it is more highly correlated with vairables which market power should theoretically affect."

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3) Finkelstein, M.O., and Friedberg, R.M., "The Application of an Entropy Theory of Concentration to the Clayton Act", The Yale Law Journal, 1967, Vol. 67, p. 678.

4) Hall, M., and Tideman, N., "Measures of Concentration", American Statistical Association Journal, March, 1967, p. 162.

5) Bailey, D., and Boyle, D.E., "The Optimal Measure of Concentration," Journal of the American Statistical Association, Dec., 1971, Vol. 66, p. 702.

6) Kilpatrick, R.W., "The choice among alternative measures of industrial concentration", The Review of Economics and Statistics, Vol. 49, 1967, p. 258.

Marfels,[7] " ... associates the concept of concentration measurement basically with two measurable phenomena, viz number and size distribution of firms or, more specifically, fewness and inequality."

Blair states:[8] "Without attempting to present any precise definition of concentration it can at least be pointed out that historically concentration has been associated with two phenomena, number of sellers and dominance of the few - or, for the statistician , the number of units in the universe and the skewness of the distribution."

Horvath concludes that:[9] "The ultimate purpose of measures of industrial concentration is a comparative appraisal of trends between different industries or the same industry between different points in time."

These quotations suffice to make the point that at this stage no generally acceptable measure of economic concentration has yet been formulated.

For the purpose of choosing measures of economic concentration for this study, the determination of the concentration of economic power is defined on the one hand, as the measurement of the size of the small number of relatively large units and their influence in a specific universe, and on the other, is the measurement of the relationship between all the units and the inequality of their size distribution in the universe to be measured.

This definition is purposely constructed so as to include the analysis of monopolistic or oligopolistic conditions as well as the portrayal of the overall structure of a universe.

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7) Marfels, C., "A bird's eye view of measures of concentration", The Antitrust Bulletin, Vol. XX, Fall 1975, p. 485.

8) Blair, J.M., Economic Concentration, op. cit., p. 351.

9) Horvath, J., "Suggestion for a comprehensive measure of concentration", Southern Economic Journal, Vol. 36, 1970, p. 446.

The first part of the definition is based on the close relationship between concentration and oligopoly. According to this approach, such a situation is more likely to be identified where one or only a few relatively large firms control a significantly large portion of their market.

The other requirement of the definition, namely to indicate the structure of the universe under examination, necessitates the inclusion of all the units in that universe in the compilation of the index.

With this dual requirement in mind, the different measures available, as well as other technical requirements for such measures, are analysed.

4.3 STRUCTURAL LEVELS AT WHICH CONCENTRATION CAN BE MEASURED

There are basically three structural levels at which concentration can be measured.

4.3.1 The establishment level (plant)

The establishment is defined in the SIC as " ... the smallest economic unit which operates as a seperate entity and for which all elements of basic industrial statistics can be reported." [10] This is the technological or actual physical production level. When concentration is measured at this level it may be with an interest in the dispersion of production, the structure of production or perhaps, as is the case in South Africa, because data is not available at ny other level. According to Conklin and Goldstein: "Comparison of product output concentration with data on employment, capital expenditures, inventory cumulation, etc. requires use of the establishment unit and data drom establishments grouped into industries." [11]

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10) SIC, op. cit., p. 5.

11) Conklin, M.R., and Goldstein, H.T., "Census principles of industry and product classification, manufacturing industries," Business Concentration, op. cit., p. 15.

Where the purpose of an analysis is to measure the concentration of economic power in an industry, an analysis at the plant level may cause misleading inferences. It often happens that more than one establishment in an industry belongs to one firm. The joint economic power for these related establishments in that industry is then vested in their controlling firm. An index of concentration of economic power at plant level would then understate the actual concentration.

4.3.2 The firm level (undertaking, company)

At this level the data for all the establishments that are effectively being controlled by the same firm are presented together.[12] The full extent of the influence that the one unit can exert on the activities and policies in that specific industry can then be indentified. For the purpose of this study the structure of industries and the distribution of economic power on a micro or industry level will also be analysed at the firm level.

An aspect which is not covered under 4.3.2 above is the case of the diversified or conglomerate enterprise which controls one or more firms that are active in more than one industry as classified by the SIC. This necessitates the distinction of the third level of measurement, namely the enterprise level.

4.3.3 The enterprise level (corporation)

An enterprise refers to the organisational structure which forms an umbrella embracing numerous firms and establishments in different industries belonging to, or being effectively controlled by, a single entity. On this level concentration of economic power is measured on a macro basis across the boudary limites of one specific industry.

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12) See 4.5 Classification of industries, page 102 for the definition of a firm.

The economic power or ability of the enterprise to influence economic activity on at least a national basis, is then at issue. Some of the larger enterprises can even have a significant influence on the international level. Studies on this level are of importance when matters of national economic policy and strategy and even political and militray policy and strategy, are at issue.

Studies of this nature have already been attempted in South Africa, but with little success.[13] Ownership and control of the large enterprises are usually too complex and disguised to be analysed without the full co-operation of the enterprise itself. A further limitation is the fact that, in terms of the Companies Act 1973, they do not have to divulge the statistical data required for studies of this nature.

The three levels for the analysis of economic concentration can also be adapted to cover varying geographical areas.

4.3.4 On a geographical base

Depending on the availibility of the relevant data, concentration studies on any of the above levels can be done in respect of different geographical areas.

Firstly, there is the regional analysis that can be done in a relatively small geographical area. This could be a border area such as Rosslyn outside Pretoria, or the Cape Town area. A study on the industrial complex of the Witwatersrand is possible, or even one on a provincial basis, such as for the Transvaal or Natal.

Secondly, these studies can be done on a national basis, such as for the Republic of South Africa, the United States of America or Canada. These studies can also be used for the international comparison of concentration in specific industries or economies.

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13) Classified information, not to be revealed.

A third possibility is the determination of international concentration. There are several international corporations or enterprises which are quite capable of influencing the international or world market for a specific commodity. Examples in the automotive, electronic, computer and other industries are numerous.

To conclude, it can be stated that the measurement of concentration can be adapted to virtually any level and area, providing a meaningful classification of the units to be measured can be made and that relevant statistical data are available.

4.4 VIARABLES USED TO MEASURE CONCENTRATION

Apart from the classification of the units to be measured into comparable categories, the criterion on which a measure of concentration is based is also a very important aspect. Only after these two basic problems have been resolved can a final decision be made on the measure to be applied.

Unfortunately, researchers on economic concentration in South Africa are faced with a host of problems regarding the availability of statistical data for the purpose of their analysis. Such data are extremely difficult to come by, either because no such data is being collected, or because those in possession of them cannot provide them, due to inefficient methods of collection and storage or because they are prevented by law from furnishing such data.

According to the Companies Act, 1973, firms need not supply all the relevant data in their annual financial statements; the Receiver of Revenue is limited by legislation on the type of data he may divulge; the Registrar of Companies, although willing to help, cannot do so without computer facilities; data collected by the South African Reserve Bank are subject to a promise of secrecy; and the Department of Statistics supplies such data only on an establishment level.

An economic concentration index is only as reliable as the data that were used to compile it.

The data that can be used in the compilation of concentration indices can basically be divided into financial and non-financial data.

4.4.1 Financial data

Any financial quantity that has the same relative importance in all the units to be included in a concentration study and that gives an indication of the size of a unit in the universe can be used as a variable. There are, however, a few variables which have some of the specific charcateristics required of a variable. Of these only the most important ones are discussed.

4.4.1.1 Turnover (sales or income)

Even though turnover may appear to be an infallible variable, it is also open to criticism. When a firm is engaged in more than one industry, its classification, according to the SIC, is determined by " ... the gross revenue obtained from the various final products produced or products handled or services rendered."[14] The firm will be classified according to its main activity, but there may be instances where its relative size will be influenced by revenue from other relatively smaller activities, so that its true position in the industry in which it is classified will not be reflected. This criticism is applicable to all variables whose data are derived from a classification according to SIC.

4.4.1.2 Total assets

Even though the use of total assets as an indicator of concentration is popular, certain factors may influence the

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14) SIC, op. cit., p. 6. It is presumed to infer sales.

accuracy of such a measure of concentration.

In the case of a diversified firm, certain investments made may not be related to the economic power in the industry in which it is classified. Differences in the dividend policies may also have an influence on total assets, which makes the comparison of firms less accurate.

Blair [15] mentions inventories as also having a detrimental effect on total assets as a variable: "In addition, they (total assets) include inventories which may also vary in accordance with judgement factors having little if anything to do with underlying economic strength."

These "judgement factors" most probably refer to the differences in the valuation of inventories.

Total assets as a variable can also be influenced by the method used to determine depreciation of fixed assets.

4.4.1.3 Fixed assets

The main components of fixed assets are land, buildings and equipment - the latter consisting of plant, machinery and, in most cases, vehicles. According to Blair[16] " ... capital assets - namely land, buildings and equipment - are preferable to any other form of financial data - sales, total assets, etc. - in measuring concentration at the corporate level."

There is, however, a relatively recent development in South Africa which will influence the reliability of fixed assets as a concentration variable. By means of leaseback arrangements, many firms are converting their investments in land, buildings and even equipment into cash by selling to financial institutions and then entering into long-term lease agreements for the same assets. According to the South African Companies

15) Blair, J.M., Economic Concentration, op. cit., p. 367.
16) Ibid., p. 361.

Act, 1973, the value of such leasebacks or leases need not be capitalised in the balance sheet and would therefore be excluded from an index of concentration. The fact that the method of vaulation and depreciation policy of individual firms will also have an influence on their fixed asset value can not be ignored.

4.4.1.4 Other financial measures

For determining macro economic concentration, contribution to the GDP and value added are also popular but not infallible measures.

Other financial measures which can also be used are, for instance, profit rates and percentage change in profit rate, equity and capital employed.[17] The credibility of such variables are debatable, but it is not the purpose of this study to analyse such less-used variables.

4.4.2 Non-financial data

Data of this kind are rather difficult to find, since most data that indicate relative situations are expressed in monetary terms. However, employment is probably the most popular variable used internationally for measuring economic concentration.

4.4.2.1 Employment

That employment is frequently used as a variable for measuring economic concentration is not because of any superior qualities but because of the greater availability of employment data. The use of employment as a variable is not above criticism, mainly because employment and capital are in certain instances substitutes. The financial backing and strength of a firm can have a substantial influence on the extent of its employment. With industrial technology advancing at such a rapid

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17) Kilpatrick, R.W., op. cit., p. 258.

pace and inflation causing the escalation of equipment prices, the firm with limited financial resources is placed at a great disadvantage. Automation, or just keeping up with technological development, is very often the privilege of the financially strong firms. It is therefore quite possible that a small firm, with little influence on an industry's policies and activities, may have a larger employment than a much larger firm, which thus wrongly gives the former a higher rating on a concentration index.

Because of automation the larger firm may find that its total employment remains constant or decreases, even though the firm is increasing in size.

However, because employment data are usually not considered to be of a confidential nature, this is often the only variable available for all firms to be included in a single classification.

4.4.2.2. Production and capacity

In certain industries it is possible to determine concentration by comparing production capacity, or even the physical units produced, for instance in the chemical, fertilizer and cement industries. There is also a high correlation between production capacity and the size of firms in the South African cement industry.

Production can also be used as an indicator of concentration in those industries where such data are available. The fact that units produced are not yet units sold, and that all the firms in such an industry do not always participate in supplying production data, impairs the soundness of such an index.

Regarding the great variety of variables that can be employed in measuring economic concentration, the essential requirement is that a variable must be a reliable indicator of the relative size of a specific unit in a specific universe and must be calculated and interpreted in the same manner for

every unit included in that universe.

4.5 CLASSIFICATION OF INDUSTRIES

Students of the concentration of economic power are at some stage or other invariably confronted with the problem of classification of the industries or products for which concentration must be determined. The representative nature and acceptability of such a classification largely determines the status of concentration indices and the reliability of the inferences to be drawn from them.

There are basically two approaches that can be followed to meet the problem of classification: Firstly, arranging the relevant concentration data according to the product or service in question, and secondly, classifying the data according to the industries where they originate. Deciding which approach to adopt, is to a large extent also dependent on the intended use of the concentration data and on the availability of comparable data.

Extensive and comparable statistical data that can be used to measure economic concentration on a product basis are practically non-existent in South Africa. Data relating to industries in the manufacturing sector, are, however, being collected on a biennial basis by the Department of Statistics. Due to the comprehensive nature of the processing of the collected data the results of the census are usually not published until at least three years after the relevant census. [18)]

The system of industry classification employed by the majority of analysts of economic concentration is the so-called Standard Industrial Classification of all Economic Activity (SIC). This is an internationally accepted classification of all economic activities and is also used by the Department of Statistics as a basis for the tabulation of their data. This system of industrial classification was developed over a period

18) Data on the Manufacturing Census - 1971 - '72 had not yet been published by July, 1976.

of many years by classification experts in government and private industry in many countries. [19]

The SIC, as used in South Africa, is based on the International Standard Classification of all Economic Activities (ISIC), 1968, with minor adaptations for local conditions. This enables the international comparison of the relevant economic concentration data. The objective of the SIC is to classify data in respect of economic activity according to homogeneous categories.

The mechanics of the system is explained with the aid of Table 4.5

Table 4.5 : Comparison of classification concepts used in the SIC and their common application in economic analysis

SIC concept	Title of category	Code number	Economic Theory Connotation
Major division	Manufacturing	3	One-digit industry
Division	Manufacturing of Food, Beverages and Tobacco	31	Two-digit industry
Major Group	Food Manufacturing	311	Three-digit industry
Subgroup	Butter and Cheese	31120	Five-digit industry

In the case of the SIC South Africa divides the one-digit industry manufacturing into nine two-digit industries, 30 three-digit industries and 181 five-digit industries.

The object with the numerical digits is to indicate the degree of refinement of the economic activity listed in a particular

19) Cf. Blair, J.M., Economic Concentration, op. cit., pp. 7 - 11; Singer, E.M., op. cit., pp. 160 - 163; Pickering, J.F., Industrial Structure and Market Conduct, The Pitman Press, Bath, 1974, pp. 2 - 4; Conklin, M.R., and Goldstein, H.T., op. cit., pp. 17 - 31.

category. Therefore, the major classification "Manufacturing" is a one-digit classification comprising the entire manufacturing industry in the economy. The more digits added to the code number of a particular category, the more refined the data in that grouping. The most sensitive grouping in this regard is the five-digit industry classification indicating data relevant to a specific manufacturing industry, such as for instance Butter and Cheese in Table 4.5.

The concentration data presented in this study are based on all four levels of classification as indicated in Table 4.5. There is a basic problem concerning the classification of data for the purpose of the analysis of economic concentration. "It is common experience that the appropriate unit for the collection of the data, and hence for its classification according to kind of economic activity, is the establishment or kind of activity unit." "An establishment' is defined as the smallest economic unit which operates as a seperate entity and for which all elements of basic industrial statistics can be reported."[20] The shortcomings of the establishment as the unit on which analysis is to be based have already been outlined in this chapter.[21]

The firm and/or enterprise is the "invisible" organisation of economic activity which may consist of a single, or in many cases more than one, establishment. For the purpose of this study, data are classified on a firm basis. Thus all the information on different establishments in an industry belonging to the same firm is grouped together as one economic unit, the reason being that the influence on economic activity as a whole, or in a specific industry, will in most instances be exerted by the firm as a single economic unit, or otherwise uniformly through the respective establishments belonging to the same firm. For purposes of competition policy they can therefore be regarded as a single entity or influence.

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20) SIC, op. cit., p. 5.

21) See 4.3.1, page 94 of this study, The establishment level (plant).

It is also possible to classify economic data for the purpose of concentration measurement according to the classification of firms listed on a stock exchange. There are, however, certain shortcomings in such a classification which could affect the conclusions to be drawn from such an index. For instance, on the Johannesburg Stock Exchange (JSE) some firms listed in the same sector are active in entirely different industries if the latter are analysed on a three or five-digit basis. A very important sector listed on the JSE is Financial Industrial. In it is listed firms active in engineering, leasing, brickmaking, investment firms and even some conglomerates. Even though they all represent financial interests, they actually represent entirely different industries which are normally not comparable in terms of economic concentration, unless compared for a specific purpose. Secondly, it is usually only relatively large firms that are listed on a stock exchange. Therefore, economic concentration will tend to be overstated in most industries, unless it is made very clear when drawing conclusions, that only listed companies are represented. Using these indices as an indication of concentration in an entire industry, or making inferences relating to the economy as a whole, could thus be misleading. 22)

Thirdly, it also happens, especially in South Africa, that many of the largest firms in a particular industry are not listed on the stock exchange. Such firms in South Africa are for example, motor manufacturers such as General Motors S.A., (Pty) Ltd. and Ford Motor Co. of S.A. (Pty) Ltd., food manufacturers such as Nestlé S.A. (Pty) Ltd., electronics and office machinery firms such as National Cash Register of S.A. (Pty) Ltd., Olivetti Africa (Pty) Ltd., and other large firms such as Lever Brothers (Pty) Ltd., and S.A. Philips (Pty) Ltd.

The SIC is certainly not without shortcomings, but until such time that representative statistical data are collected specifically for the purpose of concentration measurement, it remains

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22) "Monopolies: No need for concern", Financial Mail, December, 1976, p.

the most acceptable classification.

4.6 CLASSIFICATION OF MEASURES OF CONCENTRATION

Once a satisfactory variable has been found as well as an acceptable industry classification, the next step in concentration measurement can be taken, namely the choice of a measure with which to compile a concentration index.

Three basic approaches to the study of economic concentration were outlined in Chapter One.[23] In the ensuing discussion measures are grouped according to the approach for which they were developed.

Before discussing the measures it is, however, necessary to point out certain properties deemed desirable in a measure of concentration.

Six such properties are distinguished by Hall and Tideman of which the following are the most important:[24]

A measure of concentration must clearly indicate whether, for example industry A is more concentrated, less concentrated or as concentrated (equally) as industry B; include all the units (establishments, firms) in an industry in the index; be expressed on a range of 0 to 1 to make it easier to use.

Other properties were also distinguished by Bruckmann,[25] and Jöhnk.[26]

Measures of concentration can in the first instance be distinguished on the basis of the degree of statistical refinement. This distinction refers to the statistically more sophisticated measures on the one hand and the statistically

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23) Chapter One, page 7 of this study.

24) Hall. M., and Tideman, N., op. cit., pp. 163 - 164.

25) Bruckman, G., "Einige Bemerkungen zur statistischen Messung der Konzentration", Metrika, 14, 1969, pp. 183 - 213.

26) Jöhnk, M.D., "Einde axiomatisch begründete Methode der Konzenzrations messung", Institut für Angewandte Statistik, Freie Universität, Berlin, 1970.

less refined measures, also known as the concentration ratios, on the other. This distinction by no means implies that the concentration ratios are in any way mathematically unsound. The difference is merely that because of their relative simplicity they are simpler to apply and easier to interpret, especially by laymen and those not statistically orientated and schooled.

The more sophisticated statistical measures of concentration make use of sophisticated mathematical and statistical methods and often derive their underlying principles from other sciences. An example of the latter is the entropy [27] measure of concentration which is derived from a branch of physics known as the kinetic theory of gasses.

All the existing measures of concentration can be classified under one of the above distinctions.

In the second place, measures of concentration can also be distinguished on the basis of size distribution. The better known distinction between the main approaches for the determination of concentration is the so-called discrete and cumulative measures[28] also known as absolute[29] and summary measures[30] and a third group, referred to as relative measures of concentration. It will be shown in section 5.2 of Chapter Five that similar conclusions can be drwan from the results of most measures of concentration. The main difference between the measures lies in the varying degrees of emphasis placed on the importance of large firms in a breakdown by firm size.

The terminology used to describe these three approaches are the absolute measures, the summary measures and the relative measures of concentration. These terms will consistently be used in this study.

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27) Finkelstein, M.O., and Friedberg, R.M., op. cit., p. 678.

28) Bailey, D., and Boyle, S.E. op. cit., pp. 702 - 703.

29) Marfels, C., op. cit., p. 485; Hart, P.E., and Prais, S.J., "The Analyst of Business Concentration", Journal of the Royal Statistical Society, Series A, 1956, p. 152.

30) Marfels, C., A Guide, op.cit., p. 485.

4.6.1 Absolute Measures of Concentration

The absolute measures of concentration are also known as the abstract or discrete measures. The use of the expressions "abstract" or "discrete" derives from the fact that personal discretion must be used in determining some absolute or abstract paramaters to be used in the compilation of these indices. The most commonly used measures of concentration fall into this category.

Absolute measures are mainly concerned with the size of the few largest firms in an industry rather than with the size distribution or inequality of all the firms in that industry. Therefore, absolute measures are the best to use in an investigation of aspects of monopoly or oligopoly (competition of the few or fewness of sellers) in a specific industry. [31]

4.6.1.1 The concentration curve [32]

The concentration curve is a well-known statistical technique whereby the cumulative percentage of a variable (assets, employment, turnover, etc.) accounted for by a number of firms, usually from the largest firm downwards, is portrayed.

Since all three curves in Graph 4.6.1 intersect at the five-firm mark, portraying a five-firm concentration ratio of 75 per cent, a single five-firm ratio would indicate a misleading concentration ratio from which the impression may arise that all three industries are similarly concentrated. The fact is that the size distribution of the firms in all three industries varies significantly. Industry A, having a single

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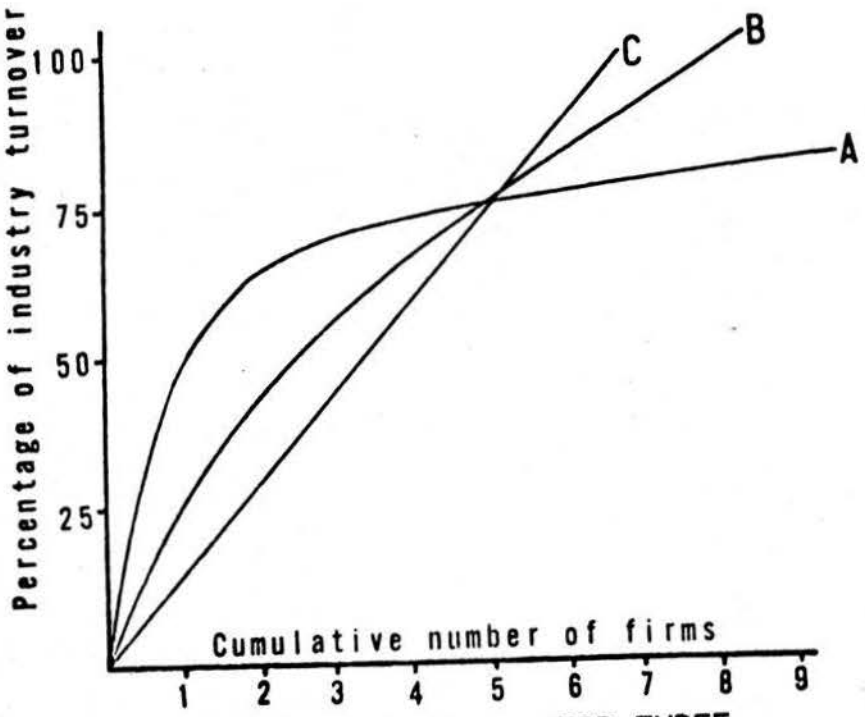
31) Blair, J.M., Statistical measures, op. cit., p. 351 - 353; Rosenbluth, G., Measures of Concentration, in Business Concentration ... op.cit., p. 57.

32) Cf Rosenbluth, G., Measures, op. cit., pp. 58 - 59; Singer, E.M., op. cit. pp. 139 - 140; Pickering, J.F., op. cit., pp. 5 - 6; Blair, J.M., Statistical Measures, op. cit., pp. 356, 358, 359.

firm much larger than either B and C, may adapt quite different price policies and practices than the other two.

From this curve it is possible to derive the proportion of turnover accounted for by any number of firms on the abscissa. Inversely, the number of firms required to account for a given percentage of total industry turnover can readily be derived. The steeper and shorter the curve the higher the degree of concentration.

The best use to be made of this measure is when absolute concentration in various industries is to be compared, or when a certain percentage of market dominance has to be identified in a specific industry, for example how many firms control 25 percent of the industry's turnover.



Graph. 4.6.1. CONCENTRATION CURVES FOR THREE HYPOTHETICAL INDUSTRIES

4.6.1.1.1 Advantages of this measure

(i) The greatest advantage is the comparability of concentration in two or more industries. If the curves for different industries are plotted on identical scales, they can be compared directly.[33] However, problems of comparison may arise when the curves of two or more industries intersect. In such a case an index based on the areas underneath the curves will help.

(ii) It simplifies the identification of the focal point of concentration in an industry. From graph 4.6.1 this can be seen as three firms for industry A and five firms for industry B.

(iii) The ease of computation makes this a popular measure to use in conjunction with others, such as the concentration ratio and the Horvath comprehensive measure of concentration which are discussed in the following paragraphs.

(iv) It is an improvement on the concentration ratio measure in that more than only a few large firms are included in the measure.

4.6.1.1.2 Criticism of this measure

(i) Unless a specific industry has relatively few firms, it is not possible to include all the firms in that industry in the curve. This may lead to misleading interpretations when comparing industries. A curve of the 15 largest firms in an industry with 1 000 firms should be interpreted differently from a curve of an industry with 50 firms. In the 1 000 firm industry it may be impossible for the five largest to obtain dominance on a geographical basis, whereas this may be possible in the case in the 50 firm industry.

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33) Blair, J.M., Statistical Measures, op. cit., p. 359.

(ii) Where two or more curves intersect at a specific level it becomes difficult to evaluate relative concentration of the industries involved beyond the point of intersection.

(iii) Since the ordinate represents dominance on a percentage basis the absolute size of firms is not taken into consideration. The largest firm in industry A may have a turnover of R100 million, whereas the largest in industry B may have a turnover of only R1 million, yet both have a 10 per cent share in their relevant industries.

(iv) Disclosure of data on individual firms is very often not allowed, which means that results can be reflected for only a minimum of the three largest and subsequent firms.[34)]

4.6.1.2 The common concentration ratio[35)]

The concentration ratio is the measure most frequently used by economists, analysts, government officials and laymen. The Supreme Court in the United States seems to have given judicial recognition to this measure in the application of the Clayton Act.[36)] It is directly related to the concentration curve and can be expressed in two ways.

Firstly, the aggregate concentration of a chosen number of the largest firms in a particular industry can be indexed as a percentage or as a decimal fraction of 1. For example, the market share of the three, four, five, ten, fifty, one hunderd or more largest firms in an industry may be given, as is the case in the United States and the United Kingdom.

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34) Pickering, J.F., op. cit., p. 5.

35) Cf. Bock, B., "Concentration Ratios: Mechanics and Meaning", Business Record, Nov., 1957, pp. 510 - 519; Singer, E.M., "Census Concentration Data: A Critical Analysis", Antitrust Bulletin, No. 10, 1965, pp. 851 - 878.

36) Finkelstein, M.O., and Friedberg, R.M., op. cit., p. 677.

Secondly, as in the case of Canada,[37] the number of firms accounting for a predetermined level of concentration, for instance 70 or 80 per cent of turnover, can be indicated.

The concentration ratio describes a specific point on the concentration curve as indicated by a specific point on the abscissa or the ordinate.

4.6.1.2.1 Advantages of this measure

(i) Statistical data on which these indices are based are usually relatively easy to secure. The American Bureau of the Census publishes such information on an annual basis. It is also available in the United Kingdom and Canada, althouh with a greater time lag.

(ii) This must be the easiest measure to compile since it simply entails the arrangement of firms according to their relative size, expressed as a cumulative percentage of their share in the whole industry.

(iii) It is much easier to interpret an index based on the concentration ratio than on any of the other measures.

(iv) Since this is such a commonly used measure, it has enhansed the standardisation of concentration data and therefore international comparison of conentration and related studies.

(v) It is the measure singled out to be most effective for identifying monopolistic and oligopolistic market situations, since it is "the dominance of a few, quite apart from the number of sellers, which tends to influence the market".[38]

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37) Economic Council of Canada, op. cit., pp. 207 - 210.

38) Blair, J.M., Statistical Measures, op. cit., pp. 355 - 356.

4.6.1.2.2 Criticism of this measure

(i) The abstract parameters chosen to indicate the concentration ratio, for example market share of the three, five or ten largest firms, are open to question as to why these specific absolute numbers were chosen. Are they reliable or representative enough to portray concentration in a specific industry?

(ii) By providing a single value to indicate concentration in a specific industry, no indication is given of the overall structure and number of firms in that industry. That is, all the firms in the industry are not taken into account.

(iii) The measure gives no indication of the relative size distribution of the firms included in the measure. Of the five largest firms measured, one may have a dominant share of the market while the other four have a more or less equal share.[39)]

(iv) Inter-industry comparisons of concentration may be misleading. Depending on the number of firms chosen to indicate concentration, the rank in concentration may change. On a three-firm ration industry A may be more concentrated than industry B, whereas on a five-firm ration the opposite might be true. This point arises where two curves on the concentration curve intersect.[40)]

(v) Another difficulty may arise when concentration between two time periods is to be compared. Should the share of the same firms be used in both ratios of should only the top five, ten or more ratios, irrespective of a change in their composition, be expressed in the latter set of ratios? It is unlikely that the same firms will remain as the largest in an industry after a considerable period of time has relapsed. Both these approaches, when comparing the trend in concentration, have merit depending on the intended use of the indices.

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39) See Graph 4.6.1, page of this study.
40) Ibid.

4.6.2 Summary measures of concentration

Summary measures are also known as cumulative measures of concentration. Whereas the absolute measures concentrate on the largest firms in an industry, the summary measures include all the firms. The main difference between the various summary measures is that different weighting schemes are used for determining the individual firms' share in the industry.

4.6.2.1 The Herfindahl-Hirchman Index (H/H)

The development of this measure is attributed to both O.C. Herfindahl and A.O. Hirchman, who developed it independently.

The index is formed by the sum of the squares of the shares of the individual firms in a specified industry. Should an industry, for example, have four firms with respectively ,4; ,3; ,2; and ,1 of the market, the index would be ,16 + ,09 + ,04 + ,01 = ,30. Thus, the larger the firm the greater its weight in the index. The H/H index is a measure employing both the absolute number of firms and their relative sizes. The index will be 1 where there is only a single firm in the industry, whereas the greater the inequality of firm-size distribution, the more closely the index will approximate 1.

Since the H/H index is rather insensitive as to the role of small firms, it is not a good measure for determining the trend in concentration of for indicating market structure. Adelman proposed the use of the reciprocal of the Herfindahl index for indicating the number of equal-sized firms that would generate the specific Herfindahl index.[41)]

4.6.2.2 The Horvath comprehensive measure of concentration. (CCI).

Janos Horvath[42)] devised an interesting modification on the Herfindahl-Hirschman index. He defines his index as[43)] "... a

41) Adelman, M.A., Comment, op. cit., pp. 100 - 101
42) Horvath, J. "Suggestion for a comprehensive measures of concentration", Southern Economic Journal, Vol 36, 1970, pp. 446 - 452.
43) Ibid., p. 446.

decimal fraction which is the sum total of the proportional share of the leading firm plus the summation of the square of the proportional sizes of each firm reinforced by a multiplier reflecting the proportional size of the rest of the industry."

Putting this into a formula we find:

$$CCI = X_i + \sum_{j=2}^{n} (X_j)^2 (1 + [1 - X_j])$$

i = 1;
j = 2,3,4 ...., n;
n = number of firms in the industry;
X = decimal fraction of variable employed, belonging to each individual firm.

If we take a hypothetical industry with four firms having a share of 40, 35, 20 and 5 per cent, respectively, the Horvath index will be compiled as follows:

$$CCI = \frac{40}{100} + \left\{\left(\frac{35}{100}\right)^2 \left(1 + \frac{65}{100}\right)\right\} + \left\{\left(\frac{20}{100}\right)^2 \left(1 + \frac{80}{100}\right)\right\} + \left\{\left(\frac{5}{100}\right)^2 \left(1 + \frac{95}{100}\right)\right\}$$

$$= ,40 + ,2021 + ,072 + ,0049.$$

$$= 0,6790$$

Here again, the more closely the index approximates 1 the higher the concentration, with 1 reflecting monopoly. Since the absolute share of the largest firm is included in the index, as well as a multiplier effect on the shares of the remaining firms, a better indication of industrial structure is given than with the Herfindahl-Hirchman index.

4.6.2.2.1 Advantages of this measure

(i) The greatest advantage of the Horvath index seems to be that it includes properties of both the absolute and the summary measures of concentration. Taking the absolute

market share of the largest firm in an industry as a starting point, an absolute element is included to be further elaborated on by the inclusion of a market share of all the other firms in that industry.

(ii) This measure is relatively easy to compute.

(iii) When concentration is measured over time, this index gives a better indication of the magnitude of change than the Herfindahl-Hirchman index.

4.6.2.2.2 Criticism of this measure

(i) Where the leading firms in an industry have almost equal shares of the market, the first firm to be quoted will tend to be overrated in comparison with the others. For example, an industry with four firms, each having ,3; ,28; ,27; and ,15 of the market, will lead to an index compiled as follows: ,3 + ,1348 + ,1261 + ,0416 = ,06025.

This, however, still gives a better indication than the H/H index, which would give a ,2638 reading for the same industry.

4.6.2.3 Frequency distribution[44)]

The common frequency distribution is sometimes used to indicate economic concentration. With this method a number of class intervals are decided on for a specific variable and the number of firms actually falling into an interval then noted.

This, however, is not a very popular measure and is not used extensively.

4.6.2.3.1 Advantages of this measure

(i) It is a very simple measure to compile and to interpret.

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44) Blair, J.M., Statistical Measures, op. cit., p. 353.

(ii) Significant inferences regarding changes in the size of firms over time can be drawn from frequency distributions compiled at different dates.

(iii) All the firms in the industry under scrutiny are taken into account.

4.6.2.3.2 Criticism of this measure

Firms may fluctuate between the different class intervals according to intensity of business activity or the general stage in the business cycle. Therefore, it would require prophetic powers to distinguish between "true" changes in concentration and changes brought about by cyclical fluctuations in economic activity.

4.6.2.4 An entropy measure of concentration (E)[45]

A relatively new approach to concentration measurement which is enjoying selective support is the entropy measure of concentration. Hindenbrand and Paschen[46] were the first to apply the information theory concept of entropy to the measurement of concentration. Others have improved on this attempt and the most comprehensive analysis thus far was presented by Theil[47] in 1967 on the application of entropy to various aspects of economic analysis.

Entropy, as it is used in this sense, originated from the entropy concept in information theory and from the physical sciences, where a measure of entropy describes the molecular disorder in a gas, as part of the kinetic theory of gases.

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45) Cf Finkelstein, M.O., and Friedberg, R.M., op cit., pp. 677 - 717; Horowitz, A. and I., "Entropy, Markov processes and competition in the Brewing Industry", Journal of Industrial Economics, July, 1968, pp. 196 - 221.

46) Hildenbrand, W., and Paschen, H., "Einaxiomatisch begründetes Konzentrationsma B", Statische Informationen, Vol.5, 1964, pp. 53 - 61.

47) Theil, H., Economics and Information Theory, North-Holland Publishing Co, 1967, pp. 290 - 293 and 372 - 374.

"In the communication theory and the physical sciences, entropy is a measure of the degree of disorder, uncertainty or randomness in a system. Suppose there are i = 1, ..., n, possible events that can occur. Let the probability of occurence of the i^{th} event be denoted by pi. The entropy in the system, or the disorder or freedom of choice is defined to be the negative of the weighted average of the logarithms to the base 2 of the pi, where the pi are the weights. In symbols, the entropy H is given by

$$H = -\sum_{i} p_i \log_2 p_i \quad 48)$$

The non-negative form of entropy if formulated as

$$H = \sum_{i=1}^{n} p_i \log_2 {}^{1}/_{p_i}$$

Tregenna-Piggot explains this as follows:[49] "If there were three possible events which could occur with the probabilities of 90 per cent, 5 per cent and 5 per cent, then the degree of uncertainty as to the event which would occur would be small. In this case there is a patent inequality, and there would be a correspondingly small value of H (H = 0,3944). If three events each have an equal change of occurence then the value of H will increase (H = 1,0985) since there will have been a rise in the level of uncertainty."

The two before mentioned values of H were calculated using logs to the base e and not to the base two, as was stated in the formulation of H. It does not matter what base is used for the logs, however, the smaller the base of the logs the bigger the interval of possible H values.

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48) Horowitz, A. and I., op. cit., pp. 196 - 197.
49) Tregenna-Piggot, J.V., The Structure, op cit., p. 6.

In a monopoly situation the prospective buyer has no choice as to where he is going to buy, he has no freedom of choice and H = 0 because there is no uncertainty as to which firm he will choose. The greater the competition the greater the value of H, until it reaches its maximum of $H = \log_2 n$ for a given number n, of firms.

Finkelstein and Friedberg[50] distinguised three different derivations that can be made from the entropy measure, namely -

(i) a competition activities derivation;

(ii) a permutation derivation;

(iii) a probabilities derivation.

Since entropy is still a relatively new approach for the measurement of concentration, it can be expected that certain adaptations, refinements and improvements to the existing theories will still be developed.

4.6.2.4.1 Advantages of this measure

(i) This method allows for the fragmentation of a set of data into sub-divisions. For example, the interrelationship between the three-digit industries and two-digit industries of the SIC can be analysed.

(ii) The measure can digest and reflect differences in both number of firms and market shares in such a manner that the relative level of concentration can be indicated, irrespective of the relative number of firms in an industry.

(iii) Together with (ii) above, this measure is also sensitive to the change in competition in the case of horizontal mergers or new entries into the industry.

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50) Finkelstein, M.O., and Friedberg, R.M., op. cit., pp. 690 - 699.

4.6.2.4.2 Criticism of this measure

(i) It is an inverse measure of concentration which runs contrary to the level of concentration - the greater the value of H, the less the level of concentration and vice versa. It has however, been proposed that this could be rectified by presenting the reciprocal of the antilogarithm of entropy as a measure of concentration.

(ii) Since the measure is expressed in logarithmic terms the direct comparability with other measures of concentration is made more difficult.

4.6.3 Relative measure of concentration

The relative measures of concentration differ from the other measures in that they are based mainly on the relative inequality of size distribution of the firms in an industry, expressed as a cumulative quantity. Although the relative measures take all the firms in the industry into account the index is expressed as a relative indicator of concentration derived from the cumulative percentage of the size distribution as well as the cumulative number of firms.

Very few writers on the subject have as yet distinguished this third group of measures. They are usually discussed as part of the summary measures. Their composition and results obtained, as compared to the abstract and summary measures, were found, in this study, to differ and consequently merit separate discussion.

4.6.3.1 The Lorenz Curve (LC)[51]

The principle on which the Lorenz curve is based was developed in 1905 by M.R. Lorenz with the aim of indicating the inequality

51) Cf. Rosenbluth, G., in: Business Concentration, op. cit., p. 60; Singer, E.M., Antitrust, op. cit., pp. 141 - 144; Pickering, J.F., op. cit., pp. 7 - 8; Hart, P.E., and Prais, S.J., op. cit., pp. 152 - 157; Blair, J.M., Statistical measures, op. cit., pp. 355 - 357.

of distribution of wealth or income in a specific population.[52] Since then this method has also been applied as a measure of relative concentration and of inequality of size distribution of firms in an industry.

The Lorenz curve takes into account all firms in a particular industry and portrays the relationship between the cumulative number of firms in that industry, expressed as a percentage on the abscissa, and the cumulative percentage of industry or market control on the ordinate. The cumulative percentage of firms includes the firms arranged from small to large. The curve depicting equal competition, A in Graph 4.6.3.1 (diagonal of equal distribution),[53] is a straight 45° line. According to this line all firms in the relevant market have an equal share in that market. The further the actual curve deviates from this line of equal competition, the greater the inequality of the size of firms in that industry.

Accordingly, the industry represented by curve D is the most concentrated on a relatvie basis. One of the major shortcomings of the Lorenz curve is displayed by the intersection of curves B and C. It is difficult to infer from these curves which of these two industries is the most concentrated. To compare them a measure such as the Gini coefficient or integration, as explained in the next section, is necessary

The Lorenz curve is especially suitable for the analysis of macro industry structure and for the comparison of relative concentration between industries. It is also a valuable tool when used in conjunction with absolute and summary measures of concentration.

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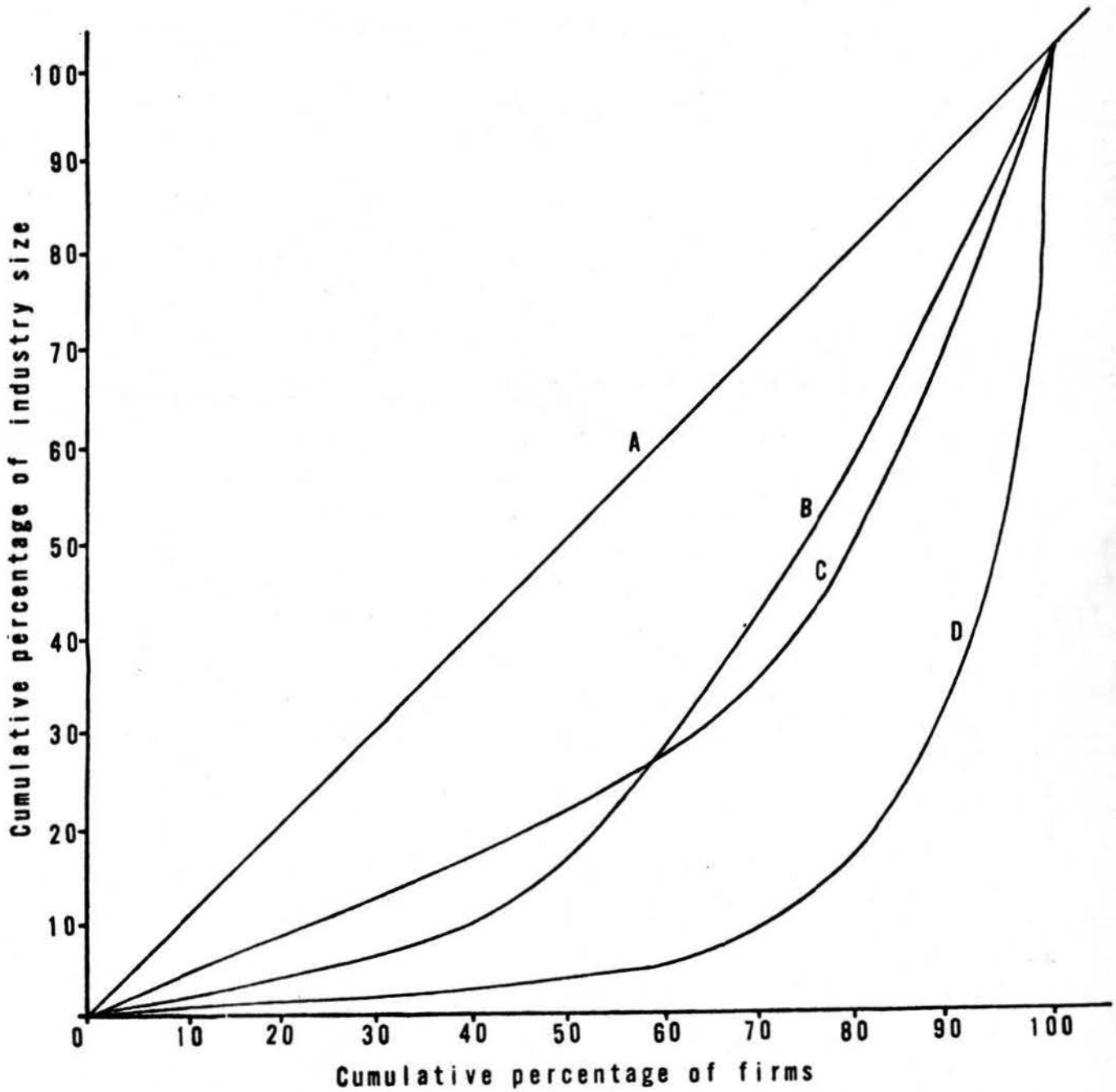
52) Finkelstein, M.O., and Friedberg, R.M., op. cit., p. 68.

53) Singer, E.M., op. cit., p. 141.

Graph. 4.6.3.1. THE LORENZ CURVE FOR FOUR HYPOTHETICAL INDUSTRIES



4.6.3.1.1 Advantages of this measure

(i) All the firms in the industry being measured are taken into account. This gives the analyst insight into the relative structure of a specific industry.

(ii) Comparisons of relative concentration can be made between industries. Inferences can be drawn as to relative industry structure.

(iii) The application and interpretation of this measure are fairly simple. Even the layman is capable of employing and understanding such an analysis.

(iv) It is relatively easy to obtain data to be used in such an analysis because the identity of individual firms is effectively protected. In certain countries, such as the United States, data of this kind are collected on an annual basis by the Bureau of the Census.

4.6.3.1.2 Criticism of this measure

Because of certain inherent qualities the Lorenz curve has been particularly subject to criticism as a measure of economic concentration.

(i) The main criticism of the Lorenz curve is that it cannot be used for direct comparison of absolute concentration between industries. The number of firms in an industry has a definite influence of competition and on the degree of absolute concentration. Assume, for instance, two hypothetical industries have ten and one hundred firms, respectively, and the ten per cent largest firms, in both cases control 70 per cent of their industries. In the case of the former it would mean one firm and in the latter case 10 firms. In terms of the Lorenz curve they appear to be equally concentrated at that point, whereas in absolute terms and actual behaviour there is a distinct difference.

(ii) The actual number of firms in an industry has a definite influence on the level of concentration as indicated by the Lorenz curve. Where two industries have almost identical absolute concentration, the Lorenz curve will tend to overstate concentration for the industry with the most firms. In the case of both industries the four, ten, twenty and fifty largest firms may for example have the same percentage share of turnover. The industry with the most firms will, however, seem to be more concentrated on the Lorenz curve.

(iii) It is difficult to compare relative concentration when the curves of two or more industries intersect.

4.6.3.2 The Gini coefficient[54)]

To increase the usefulness of the Lorenz curve, Corrado Gini introduced the Gini coefficient in 1912. The Gini coefficient relates the area between the actual Lorenz curve and the 45° line: "More precisely, the Gini coefficient is equal to the sum of the differences between every pair of firms divided by two times the number of pairs of firms and this divided by the mean firm size."[55)]

The nearer the Gini ratio approximates unity the greater the degree of inequality. Where the ratic attains the value of zero, one would thus expect the situation of perfect competition or equal distribution of economic power to exist.

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54) Cf. Singer, E.M., Antitrust, op. cit., pp. 144 - 149; Finkelstein, M.D., and Friedberg, R.M., op. cit., pp. 687 - 688; Theil, H., op.cit., pp. 121 - 123.

55) Finkelstein, M.D., and Friedberg, R.M., op cit., p. 687.

4.6.3.2.1 Advantages of this measure

In addition to most of the advantages that apply to the Lorenz curve the problem of intersection of curves is eliminated and a single value for the level of concentration is provided.

4.6.3.2.2 Criticism of this measure

Criticism is mostly the same as for the Lorenz curve. Apart from that, the Gini coefficient will produce similar results for different industries as long as the same degree of inequality exists in them. If, for instance, one industry has four firms, each controlling twenty-five per cent of the market, and another has one hunderd firms, each controlling one per cent of the market, then the Gini coefficient will be zero in both instances. There might, however, be quite different policies in operation in these two industries.

4.6.3.3 Integration on the Lorenz curve (I)[56]

This measure produces a result comparable to that of the Gini coefficient. It also presents an index which is based on the relation between the area between the Lorenz curve and the 45° line and the total area of the triangle below the 45° line. In this study only twenty predetermined points (five per cent intervals) on the abscissa of the Lorenz curve are taken.

In the case of the Gini coefficient these points are connected by means of straight lines. The sum of the areas of the resulting trapeziums are then determined. This approach is an approximation because it is not a true representation of the Lorenz curve since the curve has a concave character. The main difference between these two measures lies in the computation of the area between the Lorenz curve and the 45° line.

In this integration method the points are connected by means of the segments of an exponential curve of the function $y = ae^{bx}$ where $a > o$. The values of a and b are determined by means of the method of least squares. The starting point according to this method presents a problem in that x = o which results in a value of y = a. To overcome this problem it is assumed that the points (0,0) and (1,1) are connected by means of straight line, which presents area II below.

This method is further explained by means of the data in Appendix 2 for industry number 31, based on cumulative employment. According to the method of least squares

$$a = 0{,}127082912$$
$$b = 0{,}063771032$$

$$\therefore y = 0{,}127082912 \; e^{0{,}063771032\,x}$$

Therefore the approximate area between the horizontal axis and the Lorenz curve is given by:

$$\text{Area I} = a \int_1^{100} e^{bx} dx$$

$$= \frac{a}{b} \left[e^{bx} \right]_{x=1}^{x=100}$$

$$= \frac{a}{b} \left[e^{100b} - e^{b} \right]$$

$$= \underline{1170{,}083334}$$

$$\text{Area II} = \frac{1}{2} cd \qquad c = 1$$

$$= \underline{0{,}5} \qquad d = 1$$

$$\text{Area I + area II} = 1170{,}583334$$

$$\text{Index} = \frac{5000 - (\text{Area I} + \text{area III})}{5000}$$

$$= 0{,}76588$$

The difference between this manually calculated value and the index value in Table 7.3.4 of 0,7702 is due to approxi-

mation differences.

4.7 SYNOPSIS

Only the most frequently used measures and their basic, non-mathematical features have been noted. There still exists lesser-known measures which could, however, contribute very little to a better understanding of concentration measurement.[57)]

Untill now there is not yet any agreement as to which measure of concentration is the best to use. The measures can be divided into three main categories, namely the absolute, the summary and the relative measures of concentration.

The first category places greater emphasis on the role of the large firms and does not include all the firms in the industry being measured. The second approach includes all the firms in the industry and their individual share of that market is used to compile the index. The main differences between the various summary measures are the different weighting schemes used for the individual market share of each firm.

The relative measures of concentration differ from the former two in that an index based on the relative share of the cumulative values of both the number of firms and their cumulative shares of the market, is formulated. The inferences to be drawn form this type of analysis are quite distinct from those based on the two other methods. Therefore, when employing a relative measure, the composition of the index must be clearly understood if the conclusions are

57) Cf. The Lognormal distribution: Silberman, I.H., "On Lognormality as a summary measure of concentration", The American Economic Review, Sept., 1967, pp. 807-831; The Relative Mean Deviation Intercept: Singer, E.M., Antitrust, op. cit., pp. 149 - 152, and Hulserman, K.R., op. cit., p. 24; Pareto's coefficient: Ibid., Hulsermann, K.R., op. cit., pp. 25 - 27; Gini's index of concentration: Ibid., pp. 27 - 28; The Niehaus Index: Ibid., pp. 43 - 45; The Rosenbluth Index: Ibid., p. 45.

to be seen in the right perspective.

Because the absolute measures are historically the oldest and have the greatest appeal to common sense, they are at the moment still the most popular.

Even though the Horvath approach contains advantages of both the absolute and summary indices, and the entropy measure seems to be developing into what might be the near ideal measure of concentration, the overall superior measure has yet to be developed. However, research continues in this field and since closer co-operation between different disciplines is constantly taking place, it is hoped that an all-embracing measure may be developed soon.

The state of affairs outlined in this chapter necessitates a comparison of the results of the various measures to determine whether these are as divergent as the respective methods of calculation seem to suggest. This is done in the next chapter.

CHAPTER 5

THE CHOICE OF MEASURES OF ECONOMIC CONCENTRATION

5.1 INTRODUCTION

It has repeatedly been stressed that no generally accepted measure for the determination of economic concentration has as yet been developed. The concentration of economic power is analysed for various reasons, for instance for purposes of aiding in the formulation and implementation of competition policy, for determining industrial structure for purposes of economic policy, for determining the location of economic power, for political and strategic reasons, and many others. The ultimate use to which concentration data will be put (i.e. the objective of collecting such data) has given rise to the development of a great number of measures for the determination of economic power concentration.[1] A choice from among the large number of measures available must also be made for the purpose of this study. Analysis of the available measures and of studies in which the results of many of these measures are compared, shows that certain measures are preferable for certain purposes, even though most measures provide data from which comparable inferences can be drawn.[2]

In the first part of this chapter i.e. up to par. 5.2.6 a few of the many comparative studies are analysed in order to provide a basis for the ultimate choice of measures for this study. In the second section of the chapter the specific measures that are employed in this study are outlined.

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1) See Chapter 4 of this study for a discussion of the best-known measures.

2) See Chapter 7 and 8 for a comparison of the measures employed in this study.

5.2 DISTINGUISHING THE ULTIMATE MEASURE OF CONCENTRATION

5.2.1 Comparative study by R.W. Kilpatrick.[3]

Kilpatrick approached his study with the remark that, "Among the many concentration measures for manufacturing industries, none has been established as the best structural indicator of market power".[4]

5.2.1.1 Classification of data and variables employed

He compared the various concentration ratios[5] published by the Bureau of the Census in the U.S.A. He used the classification of the Internal Revenue Service for a study of 111 industries, making a few minor adjustments to compensate for lack of data.

He related industrial concentration to two rather unusual variables, namely profit rate and past output expansion on the one hand, and the change in profit rate from 1949 to 1954 on the other.

5.2.1.2 Measures compared

Seven basic concentration ratios are calculated and compared for the mentioned variables, namely -

"CL_8 - based on the largest eight firms in a Census industry.
CL_{20} - based on the largest 20 firms in a Census industry.
C_{5D} - based on five-digit industries.
C_I - based on industry shipments.
$C_{I,47}$ - based on industry shipments in 1947.
C_{VA} - based on value added weights.
C_{DS} - based on domestic shipments only".[6]

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3) Kilpatrick, R.W., op. cit., pp. 258 - 260.
4) Ibid., p. 258.
5) See 4.6.1.2., page 111 of this study.
6) Kilpatrick, R.W., op. cit., p. 259.

The results of the comparison of these measures are shown in Table 5.2.1. The first horizontal column, C in Table 5.2.1., was compiled from 1954 concentration ratios for four-digit industries and was used as the basis on which all the other measures were compared. For neither of the hypotheses compared was there a difference in correlation of more than ,07. "The partial correlation coefficients are so nearly equal that by statistical test no measure is significantly better than another in testing both hypotheses".[7] "The correlation between C and the other measures ranges from .929 to .998, and the lowest correlation between other pairs is .889".[8]

According to this study any of the concentration ratios can be used as structural indicators of market power and should lead to the same inferences and conclusions. In Kilpatrick's words, "This investigation has failed to label any concentration measure as the best structural indicator of market power".[9]

Table 5.2.1: Partial correlation coefficients for alternative concentration measures.[10]

Concentration measure	Partial correlation with respect to:	
	The 1950-1951, 1953-1957 level of Profit Rates	The 1949-1954 Change in Profit Rates
C	.467	.303
CL_8	.455	.266
CL_{20}	.445	.254
C_{5D}	.485	.293
C_I	.474	.325
$C_{I,47}$	.413	.268
C_{VA}	.462	.301
C_{DS}	.431	.279

7) Kilpatrick, R.W., op. cit., p. 259.
8) Ibid.
9) Ibid., p. 260.
10) Ibid, p. 259.

5.2.2 Comparative study by Christian Marfels.[11)]

Marfels presented a brief summary of various absolute and summary measures of concentration. He then applied all these measures to determine trends in concentration in the United States petroleum industry.

5.2.2.1 Classification and variables employed

This study is based on data obtained from the United States petroleum industry. Data on individual petroleum companies and for plants (i.e. refineries) are presented and compared. Concentration is measured at different levels of operation in the petroleum industry, for example at the crude oil reserves level, crude oil capacity level, gasoline refining level and gasoline market shares.

The variable used in the first part of this study is crude oil capacity at the firm level as shown in Table 5.2.2.1. In the second part of the study concentration for only the 20 largest U.S. petroleum firms is determined for the variables domestic crude oil reserves, domestic crude oil capacity, - gasoline refining capacity, and - gasoline market shares, as shown in Table 5.2.2.2.

Concentration based on these variables is measured for 1960 and 1969 to enable a comparison of the trend in concentration in this industry.

5.2.2.2 Measures compared

Marfels compares the following concentration measures in this study:

(i) The concentration ratio for the top four firms. - CR_4,[12)]

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11) Marfels, C., A Bird's Eye View, op. cit., pp. 485-503.

12) See 4.6.1.2., page 111 of this study.

(ii) the Herfindahl - Hirschman index - C,[13)]
(iii) the E-index, a derivation from entropy,[14)]
(iv) the Rosenbluth index - I,
(v) the Horvath index - CICI[15)] and finally
(vi) Gini's coefficient - R.[16)]

Table 5.2.2.1 presents the concentration indices at the company level.

Table 5.2.2.1: Concentration of crude oil capacity at the company level in the United States of America, 1960 and 1969[17)]

		Measure					
Year	No. of Companies	CR_4	C	E	I	CICI	R
1960	146	0.3196	0.0463	0.0284	0.0359	0.1704	0.8094
1969	131	0.3326	0.0512	0.0332	0.0425	0.1739	0.8205

The first measure indicates that the four largest firms control about one third of crude oil capacity. The indices obtained by means of the other measures indicate comparable levels of concentration. The same trend was observed from a comparison of concentration indices compiled by the same measures at the plant or establishment level.

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13) See 4.6.2.1, page 114 of this study.
14) See 4.6.2.4, page 117 of this study.
15) See 4.6.2.2, page 114 of this study.
16) See 4.6.3.2, page 124 of this study.
17) Marfels, C., A Bird's Eye View., op. cit., p. 492.

In Table 5.2.2.2 the same measures are used, but this time for only the 20 largest firms and based on different variables.

Table 5.2.2.2: Concentration of the 20 largest companies in the U.S. Petroleum industry at various levels of operation, 1970.[18)]

CR_4	C	E	I	CICI	R
Domestic Crude Reserves					
0.3973	0.0704	0.0614	0.0774	0.2196	0.3540
Domestic Crude Oil Capacity					
0.3890	0.0702	0.0616	0.0779	0.2163	0.3581
Gasoline Refining Capacity					
0.3851	0.0692	0.0609	0.0769	0.2170	0.3498
Gasoline Market Shares					
0.3885	0.0721	0.0632	0.0801	0.2208	0.3756

Once again the different measures indicate the same trend in concentration, even though different variables are applied at different levels of operation.

Marfels[19)] concludes that "... while the empirical examples revealed few differences among various concentration measures it should nevertheless be kept in mind that the choice of a measure may affect the outcome of an investigation. Therefore, e.g., indications of relative sensitivity (I,E) and insensitivity, (C,CICI) towards small firms call for careful formulation of the analytical properties inherent in a concentration

18) Marfels, C., op. cit., p. 496.
19) Ibid., p. 499.

measure in order to enable economists to discriminate among the rich menu of concentration measures".

5.2.3 Comparative study by Duncan Bailey and Stanley E.Boyle[20)]

These two authors commenced with a very appropriate quotation from an article by Rosenbluth:[21)] "In order to select one index as superior to others for a given purpose, careful empirical tests of carefully formulated hypotheses regarding the effects of concentration must be undertaken, and very little such work has been done to date."

They proceed to present their findings regarding such a comparative study on the initial premise that any one, or more, of the measures may be the most appropriate, but attempt to prove for themselves which one by means of standard statistical techniques.

5.2.3.1 Classification of industries and variable employed

The classification used is that of the 417 four-digit industries distinguished for the census on the manufacturing industry in 1963 in the U.S.A. Only one variable, namely value of shipments, is used.

5.2.3.2 Measures compared

Three measures are compared, namely the Herfindahl-Hirschman index, the Hall-Tideman index and the common concentration ratio. However, several variations on these measures are made and compared as explained in Table 5.2.3.

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20) Bailey, D., and Boyle, S.E., op. cit., pp. 702-706.
21) Rosenbluth, G., Measures of Concentration, op. cit., p.64.

Table 5.2.3: Seven concentration measures employed by Bailey and Boyle [22]

Reference notation	Description
HF	Traditional Herfindahl Index.
HF_8	Herfindahl Index limited to the first eight firms.
HF_{20}	Herfindahl Index limited to the first 20 firms.
HT	Hall-Tideman Index.
CR_1	One-firm concentration ratio.
CR_4	Four-firm concentration ratio.
CR_8	Eight-firm concentration ratio.

Three different groups of firm size distributions[23] distinguished while the above measures are all applied to each group of firm sizes. The correlation between the results of these measures as applied to all three groups of firm sizes is explained in Tables 3, 4 and 5 of their article.[24]

A very high inter-measure correlation was found (between the variants of the same measure), as well as between the three different measures and their variants.

The writers conclude that "... approximately the same results are obtained for both the Herfindahl Index and the simple concentration ratio".[25] According to them there is little to choose between the different measures other than that they consider the four-firm concentration ratio, CR_4, the most suitable in studies requiring a structure variable.

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22) Bailey, D., and Boyle, S.E., op. cit., p. 704.
23) Ibid., Table 2, p. 704.
24) Ibid., p. 704 and 705.
25) Ibid., p. 705.

5.2.4 Comparative study by M. Hall and N. Tideman.[26]

Their study outlines six properties which they consider desirable in any measure of concentration.[27] They refer to the problems concerning the classification of industries to be measured and the variable to be used, but do not attempt to solve these problems.[28]

5.2.4.1 Measures compared

Their main purpose is to appraise, in terms of the six properties referred to above, the common concentration ratio, the Herfindahl-Hirschman index and a new measure developed by themselves, the Hall-Tideman index. Their findings are briefly as follows:

The common concentration ratio satisfies properties 1 and 6, whereas properties 3 and 4 are violated in most instances and property 2 is not satisfied at all. The Herfindahl-Hirschman index avoids the shortcomings of the concentration ratio and satisfies all six properties described by the authors. As was pointed out in 4.6.2.1, however, there are other points of criticism that can be levelled against this measure.

They further point out that the main difference between the three measures is the different weighting schemes used to quantify the relative share of each firm in an industry.

Their analysis entails the determination of the rank in concentration of 446 four-digit SIC industries by means of the three measures. The correlation in rank according to these measures is as follows:[29]

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26) Hall, M., and Tideman, N., op. cit., pp. 162-168.

27) Ibid., pp. 163-164. Also discussed in 4.6., page 106 of this study.

28) See 4.5, Classification of Industries, p. 102, and 4.4. Variables used to Measure Concentration, p. 97.

29) Hall, M., and Tideman, N., op. cit., p. 166.

Measures	Correlation coefficient
CR - HH	.995
CR - TH	.904
TH - HH	.933

On this they remark: "These very high rank correlations suggest that with respect to ordinal qualities there is scarcely any difference between the three measures."[30] Despite the high correlation coefficients, there are several individual instances where there is a substantial difference in rank according to the different measures.

Taking into account the full scope of their research, the authors come to very much the same conclusion as in the previous studies: "It is our belief that no best measure of concentration exists and that in general the measure should be suited to the use."

"Our empirical analysis revealed that despite its analytical shortcomings the concentration ratio yields cross sectional rankings of concentration among industries that are generally similar to those of HH and TH".[31]

5.2.5 Comparative study by Janos Horvath.[32]

The purpose of Horvath's paper is to present an improved measure on the Herfindahl-Hirschman index. As part of this attempt he also presents a comparison between his new index and the Herfindahl-Hirschman index.

The comparison between the two measures is based on assets held by the firms in the three industries mentioned in Table 5.2.5.

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30) Hall, M. and Tideman, N., op. cit., p. 166.
31) Hall, M., and Tideman, N., op. cit., p. 167.
32) Horvath, Janos, op. cit., pp. 446 - 452.

Table 5.2.5: Concentration in the tobacco, aluminium and automobile industries in the U.S.A., 1937 and 1967.

Industry	Herfindahl-Hirschman - HH		Horvath - CCI	
	1937	1967	1937	1967
Tobacco	.1749	.1694	.4544	.4474
Aluminium	1.0000	.1531	1.0000	.4179
Automobile	.2802	.2868	.5823	.6040

From this table it can clearly be seen that both measures portray the same trend in the change in concentration. The Horvath index, however, is more explicit on the absolute magnitude of the change.

Apart from the advantage the CCI index has of incorporating both absolute and relative properties, it is possible to draw similar inferences from both measures.

5.2.6 Resume on comparative studies

Even though the results of only five of the many comparative studies have been outlined, they confirm that none of those compared can be singled out as being superior.

The common concentration ratio was compared in all but one of the papers discussed and was found to yield an index from which could be drawn conclusions similar to those from the other measures. This is still the most popular and most frequently used measure.

Because of the different weighting schemes quantifying the individual firm's share in an industry, the results of the various measures should be interpreted differently. Some place more emphasis on the role of a few large firms, whereas others give relatively more weight to the total number of firms, thus including the smaller firms as well.

The conclusion reached by a few authors, that one should choose the measure to be used according to the available data and to the use to be made of the index, seems to be the most

acceptable - at least until a superior measure is developed.

In the light of this conclusion, the next section reviews the measures that are used in the analysis of the South African manufacturing industry and the reason for their selection.

5.3 MEASURES OF CONCENTRATION OF ECONOMIC POWER EMPLOYED IN THIS STUDY

As was pointed out before, the main aim of this study is to comment on the structure of the manufacturing industry in South Africa. This implies that the various five-digit industries as well as manufacturing as a whole has to be analysed. Furthermore, the indices must be of such a nature that they are comparable to those in other countries and give insight into structural aspects of competition policy. Whilst this study is based on the situation as it was in 1972, it also has to serve as a basis for future study, especially because an important aspect of such later study will be to determine the trend in concentration in South Africa. With these points in mind, ten measures for determining concentration are singled out for use. The mechanics of the measures were discussed in Chapter Four.

5.3.1 Variables employed

As has already been indicated,[33] that several variables can be used to compile an index on concentration. For the purpose of this study three variables were chosen, namely:

5.3.1 1 Turnover

Turnover was defined as the aggregate of

- total sales and transfers out
- charges for repairs
- charges for installation, erection or assembly
- charges for other work done
- sundry trading revenue

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33) See 4.4, Variables Used to Determine Concentration, p. 97.

5.3.1.2 Employment

The second variable, namely employment, was defined as the total number of paid employees plus working proprietors and partners.

5.3.1.3 Fixed assets

Fixed assets were defined as the total book value of

- land,
- buildings,
- machinery (plant) and
- vehicles.

Most of the measures employed were based on all three of these variables.

Since one variable is normally sufficient to provide a concentration index, the question may arise as to why three variables were chosen.

The reason for this was twofold. Firstly, it was thought that concentration indices based on the three variables which are regarded as very important and informative as to the concentration of economic power, would provide more insight into the structural aspects of the manufacturing industry in South Africa, as well as into the nature of the concentrated economic power.

Secondly, in the analysis of the literature on the measures for the determination of concentration, no sufficiently representative comparisons of data, obtained by means of different variables, were encountered. Therefore, the comparison of the concentration data, based on all three variables, also contributes to the better understanding and applicability of the different variables.

5.3.2 Structural levels at which concentration was measured

The first level of industrial structure that was analysed was the two-digit industry level, or division grouping according to the SIC. On this level nine two-digit industries were dis-

tinguished.

On the second level the nine two-digit industries were divided into 30 three-digit industries, or major groups according to the SIC.

On the third level, the 30 three-digit industries were divided into 181 five-digit industries, thus presenting a micro-analysis of the manufacturing industry.

On the fourth level, the major division manufacturing, a one-digit classification, was analysed to determine macro-economic concentration. At this level a comparison was also made between manufacturing, wholesale and retail, and construction in terms of the one variable, turnover.

The main reason for conducting the analysis on four structural levels is to provide concentration data in various degrees of refinement, having regard to the size of the relevant industries analysed. On a one- and two-digit basis concentration data may be of interest to students with a political inclination or economists considering broad economic policy. On a three- and five-digit basis such data is of interest to those responsible for the formulation and application of competition policy, or also to students of market structure on a specific industry basis, where the analysis of market conduct regarding price, promotion, distribution and production policy is important.

5.3.3 Absolute measures

5.3.3.1 The common concentration ratio

Six variants of the common concentration ratio were used, viz.:

Firstly, the relative share of the three largest firms in an industry based on the three variables mentioned above.

Three is the smallest number of firms whose aggregate share can be indicated without contravening the secrecy clause of the Statistics Act. The manufacturing industry in South Africa is concentrated to such an extent that, had a larger number of

firms been taken for the lower measure, for instance, four or five, the average index would have shown such a severely concentrated situation that few other meaningful inferences could have been made.

Secondly, the relative share of the five largest firms in an industry, based on the three variables mentioned.

This level of measurement was taken mainly bacause of the relatively small size, in terms of number of firms, of many five-digit industries in manufacturing. It would be pointless to compile an index for, say, the relative size of the 10, 20, 30 or 50 largest firms when there are 39 five-digit industries having 10 or fewer firms.[34] Conversely, there are 58 five-digit industries where the three largest firms represent at least 70 per cent of the total market. Such high levels of measurement would in all these cases portray an indes number of 1,000, or very close to that.

Thirdly, the relative share of the ten largest firms in an industry was indexed for a two-digit and three-digit industry level. This was done because these industries comprises so many firms from various five-digit industries, that a three-firm ratio would, in most cases, indicate an insignificantly small share of the relevant industry.

Fourthly, the relative share of the 50 largest firms in an industry was indexed for a two-digit industry level for the same reason as was indicated in the previous paragraph.

Fifthly, the number of firms responsible for at least 70 per cent of the variables mentioned, in a particular industry.

70 per cent is a parameter already used by other analysts of concentration. This also seems to be a logical level at which to measure concentration since it indicates a level bordering on the lower level of absolute dominance. Monopoly conditions and behaviour can reasonably be expected to be present at such a level of industry control.

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34) See tables 9.3 and 9.3.1, pp. 237 and 238.

Sixthly, the number of firms responsible for at least 80 per cent of the variables mentioned, in a particular industry. Where the number of firms controlling at least 80 per cent of an industry would in most instances indicate a relatively low degree of concentration in the larger Western economies, this is certainly not the case in South Africa. Examples are numerous where a small number of firms control at least 80 per cent of a specific five-digit industry.

When attempting to distinguish industries in which monopoly conditions are unmistakably present, 80 per cent seems to be a very appropriate cut-off point.

To compensate partly for the shortcoming of these measures in that they do not take all the firms in the industry into account but only the few largest, the total number of firms in an industry were also listed next to every industry index. These indices were compiled on a five-digit, three-digit and two-digit level.

5.3.3.2 The concentration curve

The concentration curve was used because it is the best method available for direct comparison of concentration in different industries. Direct comparison of industries can be made at any firm or dominance level indicated on the curve.

Furthermore, this method compensates for the shortcoming of the common concentration ratio where only one level of concentration, e.g. the three-firm ratio or 80 per cent ratio, is indicated.

Because of the secrecy clause in the Statistics Act, and in order to include a more representative number of firms, the number of largest firms on this curve was indicated in units of ten and twenty firms.

The concentration curves were drawn for all the two- and three-digit industries and for manufacturing in total.

5.3.4 Summary measures

Horvath's comprehensive measure of concentration was employed because it is a definite improvement on the Herfindahl-Hirchman index in that it provides a much better indication of the influence of the largest firm in an industry. This is an important fact regarding competition policy. Furthermore, it also takes into account all the firms in a specific industry, which makes it a reliable indicator of industrial structure. This is a measure which is expected to increase in popularity and should, therefore, lend itself to international comparison of concentration data.

5.3.5 Relative measures of concentration

5.3.5.1 The Lorenz curve

The main advantages of the Lorenz curve lie in its simplicity and in the fact that it is an excellent measure for comparing relative concentration. Furthermore, it also presents an indication of relative industry structure, because it includes all the firms in the specific industry.

Despite the criticism against this measure, it has some unique qualities for analysing certain aspects of concentration.[35] As a measure on its own it may be insufficient, but used in conjunction with others, such as the concentration ratio, it can be of great value.

The Lorenz curve was drawn for all the two- and most of the three-digit industries, as well as for manufacturing in total. A Lorenz curve on turnover was also drawn for the wholesale and retail industries and for construction.

5.3.5.2 Integration on the Lorenz curve

To make it easier to interpret and compare the different Lorenz curves, an index based on the area between the 45° line

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35) See 4.6.3.1, p. 123 for a discussion of advantages and disadvantages of this measure.

and the actual curves was compiled. This enables one to make a quantitative comparison between the different curves and presents an index reflecting, once again, relative concentration.

This index was compiled for all the industries for which a Lorenz curve was drawn.

5.4 QUANTITATIVE EXPOSITION OF THE TYPE AND QUANTITY OF CONCENTRATION DATA COLLECTED

The following two Tables, 5.4.1 and 5.4.2, present an exposition of the type and quantity of concentration data that were collected by means of the previously selected measures of concentration.

In the first Table, the different measures, the industry level and the number of variables are indicated as they are applied to the three different industries.

In the second Table, the total number of indices as well as the total number of curves are indicated. The 2976 absolute indices, 211 summary indices and 122 relative indices, mainly in respect of the manufacturing industry, plus the 247 curves give some insight into the structure and competitiveness of the South African manufacturing industry.

5.5 SYNOPSIS

In the first section of this chapter it was attempted to single out a measure for determining industrial concentration that is superior to all other measures and that enjoys general international acceptance. This attempt was unsuccessful.

It is accepted, however, that because of the inherent properties of specific measures, some of them can be chosen to support the specific point of view that an analyst wants to prove. As was concluded by Marfels, "it should nevertheless be kept in mind that the choice of a measure may affect the outcome of an

Table 5.4.1: Nature and amount of information gathered with ten measures of concentration in this study

Measure used	Industry Category	SIC Title of Category	Manufacturing: Number of industries in category	Manufacturing: Number of variables used	Manufacturing: No. of indices sub total	Wholesale and retail trade: No. of industries indices	Construction: Number of industries	Grand Total
CR_3	5 digit	Subgroup	181	3	543	41	7	591
	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
CR_5	5 digit	Subgroup	181	3	543	41	7	591
	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
CR_{10}	2 digit	Division	9	3	27			27
	3 digit	Major group	30	3	90			90
CR_{50}	2 digit	Division	9	3	27			27
$CR_{70\%}$	5 digit	Subgroup	181	3	543	41	7	591
	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
$CR_{60\%}$	5 digit	Subgroup	181	3	543	41	7	591
	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
Concentration curve	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
	1 digit	Major division	1	3	3	1	1	5
Lorenz curve	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
	1 digit	Major division	1	3	3	1	1	5
Integration on the Lorenz curve	3 digit	Major group	30	3	90			90
	2 digit	Division	9	3	27			27
	1 digit	Major division	1	3	3	1	1	5
CCI 20	5 digit	Subgroup	181	1	181			181
CCI 30	3 digit	Major group	30	1	30			30

Table 5.4.2 Total number of indices and curves for each measure employed in this study

Absolute measures	Number of Indices
CR_3	708
CR_5	708
CR_{10}	117
CR_{50}	27
$CR_{70\%}$	708
$CR_{80\%}$	708
	2976
Summary measures	
CCI	211
Relative measures	
Integration	122
Total	3309
	Number of Curves
Concentration curves	125
Lorenz curves	122
Total	247

investigation."[36] Therefore, the approach of Hall and Tideman is accepted for the purpose of this study, "that in general the measure should be suited to the use."[37]

With this latter recommendation in mind, the measures outlined in the second section of this chapter are considered the best to attain the main objectives set for this study. Accordingly, ten measures for determining economic concentration are selected from the three main types of measures distinguished, for employment in this study. With the aid of these measures 3 556 concentration indices were compiled and concentration curves and graphs were drawn, mainly for the South African manufacturing industry.

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36) Martels, C., op. cit., p. 496.

37) Hall, M., and Tideman, N., op. cit., p. 167.

CHAPTER 6

THE SOUTH AFRICAN MANUFACTURING INDUSTRY

6.1 INTRODUCTION

The economic development of South Africa has gone through clearly distinguishable phases since the founding of the Dutch settlement in the Cape in 1652.[1] These stages were strongly influenced by both political events and the discovery of diamonds and gold. The industrial development in South Africa was also a direct result of these occurrences. Even though civilization was established in South Africa more than three centuries ago, it is only during the past fifty-odd years that any significant industrial development has taken place.

The prime function of this chapter is not to provide a comprehensive review of the historical development of the South African manufacturing industry, but merely to point out certain features of the economy in historical perspective which might have contributed to the concentration of economic power and which may assist in appreciating the particular structure of the manufacturing industry in South Africa as it is today.

A brief resumé of developments over the past 325 years is given in the following section.

6.2 MAIN PHASES IN THE ECONOMIC DEVELOPMENT OF SOUTH AFRICA

6.2.1 The agricultural phase. Jan van Riebeeck (1652) till the discovery of diamonds (1870).

Having started merely as a refreshment station for ships en route to the East, the Cape of Good Hope remainded a posses=

1) A comprehensive distinction and discussion of these stages is given by De Kock, M.H., The Economic Development of South Africa, P.S. King and Son Ltd., London, 1963, and also in the Report of the Commission of Inquiry into the Export Trade of the Republic of South Africa, RP 69/72, Vol. 1, Chapter 2, pp. 25 - 28.

sion of the Dutch East India Company (DEIC) from 1652 to 1795. It was during this time that the ancestors of many present-day whites settled in the Cape. They were mainly farmers and were largely dependent on the shipping station in the Cape for selling their produce. They were soon to discover, however, that the DEIC was a rather unsympathetic master, granting exclusive rights for the supply of produce to privileged individuals and officials. This, and other abuses by the Company, caused many of these earlier settlers to trek towards the interior in an effort to escape the yoke of the Company. This automatically severed their links with most forms of commerce and industry and forced them into a form of self-sufficient economy, based mainly on agriculture.

Little change occurred in the period preceding the British occupation in 1795.[2] British colonization of the Cape started in 1806 and of Natal in 1843.[3]

The year 1820 brought a wave of almost 6 000 new British settlers and with them greater opportunities for trade. This, however, did not do much to change the fate of the existing pioneers. They remained farmers and pastoralists until the discovery of diamonds at Kimberley in 1870 and gold in the Transvaal in 1886. These discoveries caused an influx of thousands of people, opened new markets for their products and gave birth to a new industry, mining. It also led to the start of a new phase in economic development.

6.2.2 The agricultural and mining phase from 1870 till 1909[4]

The discovery of diamonds and gold was surely the

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2) Andrews, H.T., a.o., (edd.), South Africa in the Sixties. A socio-economic survey, The South African Foundation, Cape Town, 1962, p. 4.

3) A comprehensive discussion of structural changes and business cycles during the period 1906 till 1936 is found in Schumann, C.G.W., Structural Changes and Business Cycles in South Africa 1806 - 1936, Staples Press Ltd., London, 1938.

4) For a comprehensive discussion of the agricultural development in this period consult: Goodfellow, D.M., A Modern Economic History of South Africa, George Routledge and Sons, London, 1931, pp. 103 - 134.

most important event in the economic history of South Africa during the nineteenth century. It had far-reaching effects on the existing population and introduced a new period of growth and development.

"The mining of precious and other minerals created a modern sector in a backward economy, enhanced governmental revenue and borrowing capacity, brought into being a railway network connecting four South African ports and Lourenco Marques with the interior, and introduced, as a spearhead of change, a considerable immigration of white settlers of different background from the main group of the existing white population."[5)]

According to Kooy and Robertson[6)] an increase of 265 per cent occurred in the white population of the Transvaal between 1890 and 1911.

The rapidly developing economy of these years contributed to the so-called "Poor-white Problem"[7)] which had an influence on most South African economic policies during that period.[8)] Since most of the white non-immigrant population never had the opportunity to develop industrial and commercial skills or to adapt to urban living conditions and traditions, they went through a very difficult period of adjustment. The Anglo-Boer War of 1899 - 1902 added much to their misery.

The mining industry could not indefinitely serve as stimulation for economic growth; around 1910 W.J. Laite, foremost protagonist for protecting industrial interests, remarked:

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5) Kooy, N., and Robertson, H.M., "The South African Board of Trade and Industries; The South African customs tariff and the development of South African industries", The South African Journal of Economics, Volume 34, No. 3, September, 1966, page 206.

6) Ibid., p. 205.

7) Ibid., p. 207.

8) Houghton, D.H., and Dagut, J., Source Material on the South African Economy 1860 - 1970, Vol. 3, 1920 - 1970, Oxford University Press, Cape Town, 1973, pp. 42 - 61.

"The mining industry has practically reached its maximum as regards its potentialities as a field for the employment of white labour. Whereas the field of manufacturing industry for skilled white labour, and for skilled capable coloured labour, would grow and expand and attain greater dimensions every few years as population increased and the home market grew bigger. It is absolutely essential that we should commence at once to make proper provision for the future by creating sources of wealth-production to supplement our annual mineral wealth."[9)]

This state of affairs and the formation of the Union of South Africa in 1910 marked the beginning of the third phase in the economic development of South Africa.

6.2.3 The industrial phase since the formation of the Union of South Africa, 1910.

The industrial revolution in Europe, during the close of the eighteenth and early nineteenth centuries, went by virtually unnoticed in South Africa. The first really important injection for local industry came with the establishment of the Union of South Africa. Uniting the former independent colonies of the Cape, Transvaal, Orange Free State and Natal under a central government made possible a uniform policy for industrial development and for improvement of the infra-structure.[10)]

As early as October 1910 the Union Government appointed a Commission of inquiry into the state of South African industry and " ... the steps which should be taken to encourage
(1) the trade and present industries of the country;
(2) the establishment of new industries; and
(3) the increased employment of white labour in such trade and industries".[11)]

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9) Kooy, M., and Robertson, H.M., op. cit., p. 207.

10) Viljoen, S.P. du Toit, Die Ontwikkeling en Betekenis van die Nywerheid, 'n Halfeeu Ekonomiese Vooruitgang 1910-1960, Die S.A. Akademie vir Wetenskap en Kuns, Pretoria, 1959, p. 57.

11) Kooy, M., and Robertson, H.M., op. cit., p. 208.

As can be seen from Table 6.2.3.1, private manufacturing industry contributed only 6,7 per cent towards the national income in 1911-'12, as against the 27,1 per cent of the mining sector. This contribution, however, increased gradually in conjunction with the industrial developement of the country.

Table 6.2.3.1: Contribution of the three main sectors of the economy to the national income 1911 - 1952[12]

Sector	1911-'12	1924-'25	1932-'33	1938-'39	1951-'52
Agriculture	17,4	19,9	12,2	12,6	13,8
Mining	27,1	17,4	24,3	20,7	13,0
Manufacturing (Private)	6,7	12,4	13,6	17,7	25,0
All other sectors	48,8	50,3	49,9	49,0	49,6

The first World War, from 1914 to 1918, caused a disruption in the flow of imported goods. The internal demand for goods rose sharply because of greater economic activity caused by war conditions and other reasons, and served as a great stimulus to local industry.

In 1916 the Industries Advisory Board was established to advise the Government on industrial development. After several intermediate developments this was followed by the Board of Trade and Industries created by the Prime Minister, General Smuts, in 1920.

After the Nationalist and Labour parties had formed a "Pact" in the June 1924 election to oust the Smuts Government, major changes took place in the economic policy of South Africa. The Board of Trade and Industries was reconstructed on a full-time basis with much wider terms of reference. One of its first tasks was to report on a new customs tariff and protection structure for local industry. This culminated in the Customs Tariff Act, No. 36 of 1925.

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12) Houghton, D.H., The South African Economy, Oxford University Press, Cape Town, 1964, p. 42.

Norval is of the opinion that, "Although a great deal of the industrial development which took place immediately subsequent to 1925 was a direct result of the impetus given by the protective measures applied in pursuance of the protective policy adopted in that year, it was nevertheless not so much the actual protection granted, but rather the fact that the Government had pledged itself to encourage and assist the development of secondary industries through the application of customs tariff protection where necessary, that acted as the main stimulant".[13)]

An indication of the development of the private manufacturing industry in South Africa is given in Table 6.2.3.2. The increase of 43 per cent in establishments, 106 per cent in employment and 45 per cent in gross value of production is phenomenal for the fourteen-year period from 1925 till the outbreak of the Second World War in 1939, especially if the situation before this period is kept in mind.

The Second World War, from 1939 to 1945, proved the most invigorating injection to South African industry up to that time.[14)] All of a sudden there were huge markets for production goods in most of the other Commonwealth countries. "A Directorate-General of War Supplies assisted in organising and providing a market for a great expansion of manufacturing production and of industrial capacity, not only in armaments, but in such items as boots and shoes."[15)]

Table 6.2.3.3 portrays the extent of private industrial progress during these war years in terms of employment, wages and net output.

The increases of 59 per cent, 162 per cent and 152 per cent in total employment, salaries and wages, and net output, respectively, give an indication of the phenomenal pace at which industry developed during these eight years.

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13) Norval, A.J., A Quarter of a century of industrial progress in South Africa, Juta and Co.Ltd., Johannesburg, 1962.

14) A thorough discussion of post-war economic growth is given by Franzsen, D.G., in Economic Growth and Stability in a Developing Economy - Some Aspects of the Union's Post-war Experience, J.L. van Schaik, Ltd., Pretoria, 1960.

15) Kooy, M., and Robertson, H.M., op. cit., p. 219.

Table 6.2.3.2:

Development of Private Manufacturing Industry in South Africa: 1924/25 to 1971/72.

Year	1924-'5	1938-'9	1954-'5	1962-'3	1963-'4	1965-'6	1967-'8	1969-'70*	1971-'2*
Category									
Number of Establishments	6 009	8 614	9 685	11 500	11 944	12 727	13 142	13 121	12 671
Compounded Growth-rate %		43	12	18	5	7	3	0	- 3,5
Number of Employees	114 876	236 123	604 633	750 548	826 018	936 534	988 946	1 164 000	1 127 000
Compounded Growth-rate %		106	156	24	10	13	6	18	- 3,5
Gross Value of Production (R'm)	114,6	281,2	2 123,1	3 491,0	4 045,0	5 104,0	5 983,0	7 370,0	9 136,7
Compounded Growth-rate %		145	655	64	16	26	17	23	24

Source: Department of Statistics

* Substantial changes made in classification of industries

Table 6.2.3.3:

Comparison of Pre-war and Post-war private industrial Employment, Salaries and Wages, and Net Output.[16]

Year	White Employment		Non-White Employment		Total Employment		Net Output
	Number	Salaries and wages (R'm)	Number	Wages (R'm)	Number	Salaries and wages (R'm)	(R'm)
1938-39	117 097	54,2	189 972	21,0	307 069	75,2	159,8
1946-47	157 016	127,4	331 967	69,6	488 983	197,0	402,0

As can be seen from Table 6.2.3.4, the contribution of secondary industry to the gross domestic product almost doubled from 1940 to 1976 whereas that of agriculture and mining declined significantly. Reasonable growth in industrial development could be expected in coming years, while recent developments in the field of mineral exploitation and export thereof hold great potential for development in die mining sector.[17]

Concentration in manufacturing has always been considered to be extremely high. Steenkamp in fact remarked that, "rather frequently, indeed, the position is one of monopoly or near monopoly."[18] The main aim of the present study is to quantify such expressed opinions on the degree of concentration in manufacturing.

6.3 GENERAL REMARKS ON SOUTH AFRICAN INDUSTRIAL CONDITIONS

South African economic conditions differ in a few very important respects from those of most other Western countries. Relative to its size, the South African economy can in sophistication, complexity, innovation, initiative and ingenuity match most of its counterparts in other countries.

16) Compiled from data in Kooy, M., and Robertson, H.M. op. cit., p. 220.

17) Regarding the growth potential of the South African economy Krogh made some interesting comments. Krogh, D.C., "Die Voor en Nadele van Stadige en Snelle Ekonomiese Groei", The South African Journal of Economics, Vol. 39, March, 1971, pp. 31 - 41.

18) Steenkamp W.F.J., Monopoly and Competition in the Union of South Africa, in Monopoly and Competition and their Regulation, Ed. E.H. Chamberlain, London, MacMillan and Co. Ltd., p. 63.

Table 6.2.3.4 :

Percentage of Gross Domestic Product by Kind of Economic Activity. 1920 - 1976.[19]

Year / Activity	1920	1930	1940	1950	1960	1970	1973	1976
Agriculture	22	14	12	17	12	9	8	7
Mining	19	17	20	13	14	10	13	13
Secondary Industry*	10	13	16	22	24	31	31	32
Services**	49	56	52	48	50	50	48	48
	100	100	100	100	100	100	100	100

* Secondary industry comprises manufacturing, construction and electricity.

** Services comprise wholesale and retail, transport, financial activities, community services, government and non-profit institutions.

There are, however, certain unique aspects to South African economic and industrial conditions.[20]

6.3.1 Geographical isolation

Certainly not the least of reasons for these differences is South Africa's geographical isolation from all the other

19) South African Reserve Bank, Quarterly Bulletin, June 1971, p. 20 and March 1977, p. 71.

20) Many of these factors having an influence on industrial development were also discussed in the "Verslag van die Kommissie van Ondersoek na die Beskermingsbeleid vir Nywerhede", U.G. No. 36/1958, Part II.

industrialised countries and the larger world markets.

Because of this geographical and technological isolation South Africa is cut off from many potential markets, from technological developments and from the relevant advantages involved. These circumstances have had a definite influence on the country's economic structure and policies, of which market fragmentation is only one aspect.

6.3.2 Size of the local market.[21]

The fact that the local market is not able to absorb a relatively large physical production "places a definite limit on the extent to which local manufacturers can benefit from economies of scale and/or prevents them from exploiting fully the decrease in cost per unit which can be had with increased utilization of capacity."[22]

As far as concentration of economic power is concerned, this size factor may be the most important influence on the South African manufacturing structure.

Apart from plants running at below optimum capacity in certain industries, there are others where a single optimusized plant would be able to supply in all of the country's needs for that particular product.[23] There are certain instances where government has condoned monopolies by allowing only one manufacturer for certain commodities, as for instance in the case of nitrogen and glass containers. Greenspan is of the opinion that such monopolies " ... can be accomplished only by an act of government intervention, in the form of special regulations, subsidies, or franchises.

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21) See also Report of the Commission of Inquiry into the Export Trade of the Republic of Sputh Africa, Vol. II, pp. 411 - 414.

22) Ibid., p. 411.

23) Hurwitz, N.H., and Williams, O., The Economic Framework of South Africa, Shuter and Shooter, Pietermaritzburg, 1962, p. 123.

Without government assistance, it is impossible for a would-be monopolist to set and maintain his prices and production policies independent of the rest of the economy."[24]

Apart from the capacity aspect, it is also relatively easy for a competent and effective manufacturer to secure a dominant share of his specific market. Once such a grip has been obtained, it is very difficult for a newcomer to make a successful entry into such a market. Numerous fruitless attempts to enter the South African beer market serve as cases in point. Examples can also be found in the detergent, match, fertilizer, macaroni, glass container, glass products, dry cell battery, cigarette, and many other industries. From the point of view of public interest, on the other hand, it will be found that many of these monopolies and quasi-monopolies can actually be justified. It allows for lower cost margins because of economies of scale and ultimately the possibility of lower prices. The latter, however, is not always passed on to the consumer.

This aspect, i.e. the size of the market, must be kept in in mind in comparing industrial concentration in South Africa with that of countries where larger markets prevail.

Another consequence is that research and development regarding existing and new products cannot be provided for by the firms themselves to the extent required and they are consequently dependent on institutions such as the CSIR and others operating on a joint basis in certain industries.[25]

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24) Greenspan, A., Antitrust, Capitalism: the Unknown Ideal, New American Library, New York 1967, p. 68.

25) In this regard consult: Van Wyk, R.J., "The Relationship between scientific research and economic growth and its possible implications for government policy in South Africa", South African Journal of Economics, March 1968; Van Wyk, R.J., "Research and development as a source of technical information", paper read at the 66th Annual Congress of the South African Association for the Advancement of Science, Lourenco Marques, July,1968; Report of the Commission of Inquiry into the Export Trade of the Republic of South Africa, pp. 142 - 146.

6.3.3 Government participation and intervention

What may also be seen as a consequence of the country's relatively small market is the participation of the South African government in many spheres of industry.[26] Because of the vastness of the country and the lack of sufficient risk capital, private enterprise is disinclined to enter in activities such as telecommunications, the railways, airways, production of electricity, etc. There was a time when no private enterprise was willing to manufacture and provide steel on a national basis.

These conditions have given rise to the formation of government monopolies such as the South African Railways and Harbours (S.A.R. & H.), the South African Airways (S A A), the Electricity supply Commission (ESCOM), the South African Broadcasting Corporation and Television (SABC and TV), and many others. In some state activities, such as the South African Iron and Steel Corporation (ISCOR), the South African Coal, Oil and Gas Corporation (SASOL), the Phosphate Development Corporation (FOSKOR), the Industrial Development Corporation (IDC) (as is sometimes maintained) and others, the State actually operates in direct competition with private enterprise.

These are artificially created monopolies and oligopolies which are likely to remain part of the economic structure for the foreseeable future.[27]

Another aspect of government activity which merits mentioning is lack of sophistication in the implementation of competition legislation regarding monopolies. Although the present Monopolies Act (1955) provides the machinery for the efficient control of monopolies, it is very seldom used.[28] Combinations such as those between Rand Selection Corporation Ltd. and Schlesinger Insurance and Institutional Holdings Ltd. and between South African Breweries Ltd. and Federated Stores

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26) Cf. Van der Merwe, S., The Environment of South African Business, Maskew Miller, 1976, pp. 105 - 106.

27) Terreblanche, S., Vernuwing en Herskikking, Tafelberg, Kaapstad, 1973, p. 45.

28) Only 18 investigations were commissioned over the 21-year period 1956 - 1976. For a complete discussion consult Mouton, D.J., op. cit., pp. 229 - 241.

Ltd., would never have passed as unopposed under the antitrust laws of the U.S.A. and the Fair Tradings Act of the U.K. as they did in South Africa. Conglomorates such as the Anglo American Corporation, South African Breweries Ltd., Federale Volksbeleggings Ltd. and Protea Holdings Ltd., to mention but a few, could have experienced more legislative restraint than up to now. The attitude of the South African legislature has always been not to prevent the concentration of economic power, but to control the abuse of such power.[29] Thus, the lack of actual control over concentration, despite the Act, has created an ideal setting for the concentration of economic power in South Africa.

6.3.4 Aspects of employment.[30]

Even though South Africa has an abundance of unskilled labour, the fact that workers are of different races and cultures is placing its stamp on industry. By means of tax- and other concessions, industry is being encouraged to decentralise to areas where there is a natural local labour force. These arrangements may give some firms a competitive advantage over their counterparts and may effect the distribution of economic power.

Something which to some extent also favours greater concentration of economic power is the shortage of skilled manpower. The outstanding shortage in this regard is the lack of exceptional entrepreneurial and managerial talent. Without these qualities, which are difficult to obtain, the chance of success for new entrants in a market is remote. By paying higher salaries and wages and offering more attractive frings benefits and working conditions, the larger and finansially stronger firms usually keep a strong hold on such expertise.

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29) Monopolies Act 1955, section 2.

30) For a discussion, Cf. "Verslag van die Kommissie van Ondersoek" U.G. No. 36/1958, pp. 32 - 36; Van der Merwe, S., op. cit., 181 - 201.

6.3.5 Demand concentration

The size of many firms in industry is also influenced by structural aspects on the demand side of the market. A feature of the South African market is that there are many large buyers. In a relatively small market these large buyers can thus be expected to have a significant influence on the activities of their suppliers.

These large buyers are found in the mining industry, the motor industry, Government departments, provincial administrations, municipalities, major engineering firms, state corporations, co-operative societies, mass-merchandisers and many others.

In an effort to comply with the requiremetns regarding volume, specifications, quality and the delivery dates of these large buyers, the smaller manufacturing and distribution firms often tend to expand through combination. Once they have attained a stronger position regarding supply they are obviously in a better bargaining position and are also better equipped to meet the demand.

Since large buyers give rise to large suppliers this aspect must to some extent also be regarded as a factor contributing to the high level of economic concentration in South Africa.

6.3.6 Conglomerates in the mining industry

Due to the nature of the mining industry, involving vast amounts of capital and expertise, it is usually large public companies that run and develop mining ventures. This phenomenon has given rise to the fact that control of almost the entire mining industry in South Africa is concentrated in the hands of six mining houses.

The mining activities of most of these mining houses have thus far proved very successful, resulting in a substantial surplus cash flow. This aspect, together with the fact that mineral deposits are a "wasting asset", is causing most of

these mining houses to diversify their investments into other branches of industry. With their substantial financial backing and economic power they are thus able to establish powerful groups in secondary industry and in the financial sector. These conglomerate activities and expansion of influence are therefore contributing to the concentration of economic power in the economy. This is a very significant although not always desirable feature of the structure of the South African economy because of certain undesirable effects referred to in Chapter Two.

6.3.7 Conglomorates in the financial sector.[31)]

The development of powerful and influential conglomorates is not a feature confined to the mining industry. Several financial institutions in the insurance and banking industry are cases in point. Of their enormous inflow of cash from policy holders, clients, shareholders and investment returns, they are obliged to channel a large portion into safe and lucrative investments. The sound financial policy of most of these institutions has guided them into a vast range of diversified investments. In many instances the vastness of these amounts available and the need of safeguarding their interests have forced them to obtain controlling interests in many branches of industry. In others they did so willingly because of the soundness and attractiveness of the investment opportunity. Today, there are a few large insurance companies with large interests in banking, secondary industry, and the mining industry.

This concentration of economic power in both the mining industry and the financial sector has given rise to the fact that a substantially large share of the South African economy is controlled by relatively few of the largest groups in South Africa. A disturbing aspect of this feature is the foreign influence in some of these large groups.

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31) In this regard consult the reports of the Franszen Commission: Report of the Commission of Inquiry into Fiscal and Monetary Policy in South Africa, Government Printer, Pretoria, 1970.

Other features of the South African economy that were already discussed to some extent in Chapter Two, are the dependence on foreign capital, the effect of economies of scale, and the average size of South African industries in relation to foreign competition and the potential employment of economic power to achieve political gains.

6.4 SYNOPSIS

In the light of the preceding discussion it is quite clear that the South African industrial sector is still in the process of developing. It can not yet be considered a fully developed system.

The role played by the Government is also very dynamic. A report from a Commission of Inquiry into the Regulation of Monopolistic Conditions Act of 1955, suggests some radical changes to existing legislation, which may in turn have an influence on the industrial structure.

With the increasing improvement of international transportation and communication and with the vast supply of local raw materials, a good future can be expected for local industry.

Another factor already acting as an important stimulant to local manufacturing is the increasing purchasing power of the non-white population. Apart from their becoming economically active in greater numbers and on higher levels of management and employment, there has also been a noticeable improvement in their earnings. It is at present a focal point of government policy to improve their economic, social and cultural standing.

The development of homelands for the various Bantu ethnic groups and border industrial areas is undoubtedly also going to have its effect on the future development of South African industry. Besides enhancing decentralisation, it will also influence industrial structure and ownership and ultimately industrial concentration.

CHAPTER 7

THE STRUCTURE AND CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A DIVISION OR TWO-DIGIT INDUSTRY BASIS[1)]

7.1 INTRODUCTION

According to the Standard Industrial Classification the major division manufacturing (the manufacturing industry as a whole), a one-digit classification, is divided into nine divisions or two-digit industries. The nine two-digit industries, as well as the number of three and five-digit industries that they include, are indicated in Table 7.1. The object of a two-digit industry classification is to group together all those establishments and firms that are related in the sense of the broad use of the final products, the basic raw materials or semi-processed materials used, the type of products manufactured or the broad nature of the production process. These principles give rise to the classification of food, Beverages and Tobacco, which are grouped together as ultimate consumer goods; Wood and Wood products, including Furniture, as making use of the same raw materials and manufacture of Chemicals, and Chemical, Coal Rubber and Plastic products, as making use of the same type of production processes.

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1) Except where specifically indicated, the data presented and discussed in the following chapters and the Appendices have been processed and summarised from data obtained from the 1972 Census of Manufacturing, mainly by means of computer programmes written and designed especially for the purpose of this study.

Table 7.1: Two-digit industry titles of category and distribution of number of three-digit and five-digit industries in manufacturing in South Africa.

Two-digit industry number	Title of category	Number of three-digit industries	Number of five-digit industries
31	Food, Beverages and Tobacco	4	34
32	Textile, Wearing Apparel and Leather Industries	4	31
33	Wood and Wood Products, including Furniture	2	11
34	Paper and Paper Products; Printing and Publishing	2	8
35	Chemicals and Chemical, Petroleum. Coal, Rubber and Plastic Products	6	21
36	Non-metallic Mineral Products, except Products of Petroleum and Coal	3	11
37	Basic Metal Industries	2	4
38	Fabricated Metal Products, Machinery and Equipment	6	46
39	Other Manufacturing Industries	1	15
9		30	181

For an analysis of concentration on a two-digit level, industry number 39 (Other Manufacturing Industries) does not constitute a coherent whole since it comprises several unrelated industries such as jewelry, musical instruments, and sporting and athletic equipment. The concentration indices for this industry should therefore be interpreted with this qualification in mind.

Whatever the purpose or intended use of concentration data on a two-digit industry basis, the relevant data should always be interpreted with the understanding that the two-digit classification is very broad and comprises numerous related industries. According to Table 7.1, industry number 38 (Fabricated Metal Products, Machinery and Equipment) includes no fewer than six three-digit and 46 five-digit industries. Concentration in these more closely related industries may differ considerably from that of the broad two-digit classification.

In this chapter the structure and concentration of economic power in the manufacturing industry are analysed according to the various variables and measures outlined in Chapter Five. The reliability of the data is also tested with a view to their statistical significance.

7.2 BASIC STRUCTURAL COMPONENTS

7.2.1 Distribution of firms

The firm is defined as one or more establishments bound by the same ownership or control. Therefore, the firms analysed in this section represent the number of independent decision-making units which may comprise one or several establishments or manufacturing units.

The distribution of firms is outlined in Table 7.2.1.

Table 7.2.1: Distribution of firms on a two-digit industry basis in the South African manufacturing industry - 1972.

Industry number	Number of firms	Percentage
31	1603	13,3
32	2034	16,2
33	1175	9,8
34	981	8,1
35	839	7,0
36	742	6,2
37	222	1,8
38	3946	32,9
39	563	4,7
	12105	100,0

Source: See footnote 1, page 165.

From this table it is clear that industry 38 (Fabricated Metal products, Machinery and Equipment) has by far the largest number of firms in manufacturing, namely 3946. Second in line is industry number 32 (Textile, Wearing Apparel and Leather Industries), with 2034 firms, and third industry number 31, with 1603 firms.

An explanation for the large number of firms in industry 38 may be the many different industries included in that category. These industries manufacture a large variety of products. Table 7.1 confirms this feature, indicating respectively six three-digit and 46 five-digit industries.

From the nature of the activities of the firms classified under industry 37 (Basic Metal Industries) it should be obvious why its share of the total number of firms is the smallest namely, only 1,8 per cent. Only firms active in the manufacture of primary iron and steel products and primary non-ferrous metal products are included. Their activities range from the smelting of ore in blast furnaces to the semi-finished stage in rolling mills and foundries. The relatively small local market has room for only a few large firms of this nature.. They require vast amounts of investment capital and technological expertise as well as long production runs to operate economically. The export market has, however, opened up possibilities which can lead to the expansion of the industry. Such expansion need not necessarily lead to the establishment of more firms, but can also be achieved through the natural growth and expansion of existing firms.

7.2.2 Distribution of turnover

The total turnover of R9421,6 million in manufacturing for the year up to June, 1972, was distributed amongst industries as shown in Table 7.2.2

Table 7.2.2: Distribution of turnover in the manufacturing industry on a two-digit industry basis - 1972.

Industry number	Turnover (R'm)	Percentage
31	2035,5	21,6
32	1066,8	11,3
33	278,4	3,0
34	585,4	6,2
35	1402,3	14,9
36	410,3	4,4
37	855,3	9,1
38	2657,6	28,2
39	130,0	1,3
	9421,6	100,0

Source: See footnote 1, page 165.

The 28,2 per cent share of industry number 38 in total turnover can be explained partly by the relatively high unit price of most products manufactured in this category, as well as the broad market, industrial and consumer, which the industry supplies.

Industry 31, in second place with a 21,6 per cent share of total turnover, provides primary consumer goods. Even though unit prices are usually relatively low, the physical turnover is high since every person in the country is a potential consumer of most of these goods.

In third place, industry 35, with a share of 14,9 per cent of total turnover, provides products used in virtually every production process as well as a multitude of products for the consumer market.

An analysis comparing profitability and turnover in the various industries should provide interesting results. This, however, calls for an investigation on its own.

7.2.3 Distribution of employment

The distribution of employment in manufacturing is outlined in Table 7.2.3.

Table 7.2.3 Distribution of employment in the manufacturing industry on a two-digit industry basis - 1972.

Industry number	Number of employees	Percentage
31	164279	14,5
32	226995	20,1
33	71851	6,4
34	66056	5,8
35	103024	9,1
36	80794	7,1
37	86736	7,7
38	314796	27,8
39	16537	1,5
	1131068	100,0

Source: See footnote 1, page 165.

From this table it is clear that industry number 38 comprises the largest share of total manufacturing employment, namely 27,8 per cent. Industry number 32 is second, with 20,1 per cent, and industry number 31 third, with 14,5 per cent of total employment.

Even though phenomenal technological advances and developments have occurred with regard to the automation of the production of fabricated metal products, machinery and equipment, many of these developments have not yet been introduced into the South African manufacturing industry. Despite the high capital intensity of many of these industries, the majority of them still have a very high labour component. Together with the great variety of three and five-digit industries classified under industry 38, this partly explains its large share of total employment.

Traditionally the textile industry has a large labour force. Even though technological progress has contributed largely to the automation of this industry in South Africa, it still remains one of the largest employers of the manufacturing labour force.

Because of the limited scope and nature of industries classified under industry 39 it accounts for the smallest share, only 1,5 per cent, of the total employment.

7.2.4 Distribution of fixed assets

Assets were defined as the net book value of land, buildings, machinery (plant) and vehicles. The total value of fixed assets of R3232,3 million, as on 30th June, 1972, was distributed on a two-digit industry basis as indicated in Table 7.2.4.

Table 7.2.4: Distribution of fixed assets in the manufacturing industry on a two-digit industry basis on 30th June, 1972.

Industry number	Fixed assets (R'm)	Percentage
31	519,2	16,1
32	231,3	7,2
33	78,4	2,3
34	235,3	7,2
35	656,7	20,3
36	263,5	8,2
37	687,6	21,3
38	548,5	17,0
39	11,8	0,4
	3232,3	100,0

Source: See footnote 1, page 165.

The largest share of fixed assets, namely 21,3 per cent, held by industry 37, can be attributed to the high capital investment required for the establishment of a basic metal industry. The investment involved is highlighted by the fact that, according to Table 7.2.1, this industry has the smallest number of firms in manufacturing. The relative investment per firm must therefore be comparatively high.

The same argument also applies to the second-largest industry, number 35, with a share of 20,3 per cent of fixed assets. Considerable capital investment is required before production of chemicals, coal, rubber and plastic products can commence, mainly because of the sophistication of plant and processes. The establishment of Sasol II is a case in point.

7.2.5 A comparative review of structural components

A comparison of the rank of the four structural components, discussed in the foregoing paragraphs is presented in Table 7.2.5 on the basis of relative percentages.

Table 7.2.5: Comparison of distribution of structural components of the manufacturing industry on a two-digit industry basis 1972.

Industry number	Number of firms %	Rank	Turnover %	Rank	Employment %	Rank	Fixed assets %	Rank	Rank on average[2]
31	13,3	3	21,6	2	14,5	3	16,1	4	2
32	16,2	2	11,3	4	20,1	2	7,2	6	3
33	9,8	4	3,0	8	6,4	7	2,3	8	8
34	8,1	5	6,2	6	5,8	8	7,2	7	7
35	7,0	6	14,9	3	9,1	4	20,3	2	4
36	6,2	7	4,4	7	7,1	6	8,2	5	6
37	1,8	9	9,1	5	7,7	5	21,3	1	5
38	32,9	1	28,2	1	27,8	1	17,0	3	1
39	4,7	8	1,3	9	1,5	9	0,4	9	9
	100,0		100,0		100,0		100,0		

Source: See footnote 1, page 165.

From this table it is clear that on average, based on these four variables, industry 38 constitutes by far the largest share of manufacturing.

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2) An attempt to find a final ranking of industries to incorporate all the variables, is made by ranking them according to the totals of all the rankings. The industry showing the smallest total, industry 38 in this instance, is indicated as having the largest share according to all the variables and is ranked no. 1. This procedure is acceptable only if there is a significant degree of concordance in the rankings constituting the totals. This was found to be the case, as is shown in section 7.5.

Second in line is industry 31, and third comes industry 32.

In terms of the four components of industrial structure discussed thus far, industries 38, 31 and 32 constitute the largest share of the total manufacturing industry. This is not an indication that they are more important to the national economy, but merely that they represent the largest proportion of firms, turnover, employment and fixed assets in the South African manufacturing industry.

There need not necessarily be a close relationship between rankings according to the four individual structural components. Number of firms, for instance, depends more on the nature of the industry and its market, whereas employment is dependent on the labour-intensity and technological development of a particular industry. Therefore, rank on average is merely what it says: an indication of the rank of a particular industry in the whole of manufacturing, according to the four defined variables.

Statistical analysis has shown a significant degree of concordance in the ranking of the industries according to the four structural components. Kendall's coefficient of concordance of 0,683 is significant at the 0,005 per cent level.[3)]

7.3 CONCENTRATION OF ECONOMIC POWER

Nine measures of concentration of economic power are applied on the two-digit industry level in this section. They are discussed according to their grouping as being either absolute or relative measures of concentration. The rank in economic concentration of these nine industries is also presented.

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3) See Table 7.5, page 188.

7.3.1 The common concentration ratio

The indices of the common concentration ratio are based on three variables, namely turnover, employment and fixed assets. The rank of each two-digit industry, according to each of these variables, is discussed below.

The actual share of the 10 and 50 largest firms, as well as the number of firms responsible for at least 70 per cent and 80 per cent of the three variables in each industry, is given in Appendix 1.[4] Table 7.3.1 outlines the rank in concentration according to the concentration ratios in the Appendix.

According to all the measures industry 37, is definitely the most concentrated. Second in line is industry number 36 and third is number 35. The least concentrated industry is number 38. This is significant when compared to Table 7.2.5, where industry number 38 was shown to be the largest in the manufacturing industry, according to the four structural components analysed. Accordingly, the industry constituting the largest share of the manufacturing industry seems to be the least concentrated.

From the indices in Appendix 1 it can be inferred that economic power in the South African manufacturing industry is highly concentrated in terms of all three of the variables employed. Outstanding amongst the three, however, is concentration measured against fixed assets. The lowest concentration ratio on a 10-firm basis, found in industry number 32 is no less than 23,20 per cent of fixed assets. The highest ratio is 86,76 per cent of fixed assets for the 10 largest firms in industry number 37 (4,5 per cent of all firms in this industry).

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4) Appendix 1: Concentration indices for two-digit manufacturing industries in South Africa, 1972.

Table 7.3.1: Rank in concentration of economic power according to the concentration ratio measures for two-digit manufacturing industries 1972.

Industry	Turnover				Employment				Fixed assets				Rank on average
	10	50	70 %	80 %	10	50	70 %	80 %	10	50	70 %	80 %	
31	5	6	6	6	6	6	6	7	7	7	8	8	6
32	9	9	8	8	8	8	8	8	9	8	7	7	8
33	7	7	7	7	7	7	7	6	5	6	6	6	7
34	4	4	4	4	4	2	2	2	4	4	4	4	4
35	2	3	3	3	3	4	4	3	2	3	2	2	3
36	3	2	2	2	2	3	3	5	3	2	3	3	2
37	1	1	1	1	1	1	1	1	1	1	1	1	1
38	8	8	9	9	9	9	9	9	8	9	9	9	9
39	6	5	5	5	5	5	5	3	6	5	5	5	5

At the 50-firm level, the lowest fixed asset concentration is 48,62 per cent. The highest concentration at this level, again industry 37, is 97,39 per cent of fixed assets for only 22,5 per cent of the firms in this industry.

From these particulars it can be inferred that only a relatively few large firms in each manufacturing industry own most of the fixed assets, employ most of the labour, and have by far the largest share of total turnover in each specific industry. Apart from these few large firms there are many much smaller firms in each industry.

These measures, however, do not take into account productivity and profitability. Many of the smaller firms may utilise their capital and scarce resources much more efficiently and thus provide a better return on investment. This again is a field which calls for much-needed investigation.

7.3.2 The concentration curve

It has been pointed out that a measure of concentration which should be used in conjunction with the concentration ratio is the concentration curve.[5] The concentration curves based on turnover, for the nine two-digit industries, are included in Appendix 2. Even though the number of firms on these curves includes only the 150 largest firms, the least concentrated industry, namely 32, indicates turnover in excess of 50 per cent for these 150 firms.

Table 7.3.2 represents the rank in concentration of these industries according to the concentration curves in Appendix 2. As these curves intersect, it makes it difficult to state with absolute certainty the rank in concentration of these industries. The gradient of the curves is of such a nature, however, that rank in concentration can reasonably be inferred by mere observation.

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5) See 4.6.1, page 108 of this study.

Table 7.3.2: Rank in concentration based on turnover for two-digit manufacturing industries according to the concentration curve - 1972.

Industry number	Rank
31	6
32	9
33	7
34	4
35	3
36	2
37	1
38	8
39	5

The ranking of industries according to this measure corresponds remarkably closely with the ranking according to the concentration ratios. Industry number 37 is again the most concentrated, with industries 36, 35 and 34 respectively second, third and fourth.

The least concentrated, taking into account the 150 largest firms, are industries 32 and 38, respectively.

The focal points in concentration, seem to be between 10 and 20 firms for all the industries. Following this focal point on the curve, the gradient tends to start flattening out, indicating a more even distribution of turnover amongst firms.

7.3.3 The Lorenz curve

This measure gives an indication of the relative concentration of economic power. Appendix 2[6)] contains the statistical data and the Lorenz curves for each of the two-digit industries. When the curves are analyzed it becomes apparent that

6) Appendix 2: Cumulative concentration of economic power in the South African manufacturing industry - 1972.

It is quite apparent that relative concentration, indicated by fixed assets, is in many instances considerably higher than what is indicated by turnover and employment, especially in the 10 per cent and 25 per cent brackets.

Table 7.3.3.2 gives an indication of the rank in relative concentration at 10, 25 and 50 per cent of firms level for the three variables. Because of the high level of concentration it seems pointless to indicate rank in concentration at the 75 per cent of firms level.

Table 7.3.3.2: Rank according to relative concentration on the Lorenz curve at a 10, 25 and 50 per cent firm level for two-digit manufacturing industries.[7)]

Percentage of largest firms	Industry Number								
	31	32	33	34	35	36	37	38	39
	Rank in concentration								
10%									
Turnover	6	7	9	2	4	1	3	5	8
Employment	3	7	8	2	5	6	1	4	9
Fixed assets	7	5	8	4	3	2	1	6	9
25%									
Turnover	3	7	9	5	4	1	2	6	8
Employment	3	6	8	2	5	7	1	4	9
Fixed assets	6	5	8	4	2	2	1	7	9
50%									
Turnover	1	1	9	6	5	1	4	6	8
Employment	3	1	7	4	4	8	2	6	9
Fixed assets	6	4	8	5	2	3	1	7	9

7) From Appendix 2 and Table 7.3.3.1, page 179.

Closer inspection of Table 7.3.3.1 reveals an exceptionally high level of relative concentration in the South African manufacturing industry. With the 10 per cent largest firms in a specific industry controlling at least 61,4 per cent of turnover, 54,4 per cent of employment and 66,7 per cent of fixed assets, fairly little remains in the hands of the remaining 90 per cent of firms.

When the relative concentration at the 50 per cent level of firms level is considered, the results are even more remarkable. 50 per cent of the firms control at least 95,3 per cent of turnover, 91,4 per cent of employment and 94,6 per cent of fixed assets. From this it seems that industrial policy is being determined by relatively few firms in each industry.

7.3.4 Integration on the Lorenz curve.

Since the interpretation of the Lorenz curves on a comparative basis may often be complex,[8] the indices in Table 7.3.4 were developed. These indices are compiled from the statistical data in Appendix 2 and present a single value for all the points indicated on a particular Lorenz curve.[9]

Table 7.3.4: Concentration indices compiled by means of integration on the Lorenz curve for two-digit manufacturing industries 1972.

Industry Number	Number of firms in industry	Turnover	Rank	Employment	Rank	Fixed assets	Rank
31	1 603	,8309	4	,7702	3	,8506	7
32	2 034	,7908	7	,7589	6	,8784	5
33	1 175	,7396	9	,7025	8	,8291	8
34	981	,8296	5	,7830	2	,8952	4
35	839	,8319	3	,7592	5	,9113	2
36	742	,8499	1	,7312	7	,9093	3
37	222	,8347	2	,8109	1	,9256	1
38	3 946	,8224	6	,7659	4	,8564	6
39	563	,7487	8	,6657	9	,7534	9
	Average	,8087		,7497		,8677	

8) See 4.6.3.1.2, page 123 of this study.

9) See 4.6.3.3, page 125 of this study.

To supplement the data in this table, the rank in concentration according to integration on the Lorenz curve is also presented. Once again the basic metal industry, number 37, stands out as highly concentrated.

The closer the value of this index approximates unity, the more concentrated the structure of the relevant industry tends to be. When the results in Table 7.3.4 are analysed with this in mind, it is clear that the South African manufacturing industry is highly concentrated. Average concentration, measured in terms of integration on the Lorenz curve based on fixed assets, turnover and employment in the manufacturing industry, amounts to 86,77 per cent, 80,87 per cent and 74,97 per cent, respectively.

7.3.5 A comparative review of the results obtained by the various measures.

In this section the rank allocated to each industry according to each variable for all the measures employed, are compared. Firstly, the results according to the same variable are grouped together, whereupon the average for all the variables is used to reach a final indication as to the rank in concentration of each two-digit industry.

Tables 7.3.5.1 to 7.3.5.3 present the rank according to the various measures for each of the three variables.

Table 7.3.5.1: Rank in concentration based on turnover according to the various measures used for two-digit manufacturing industries - 1972.

Industry Number	Concentration ratio				Concentration curve	Lorenz curve			Integration on the Lorenz curve	Rank on average
	10	50	70%	80%		10%	25%	50%		
31	5	6	6	6	6	6	3	1	4	5
32	9	9	8	8	9	7	7	1	7	8
33	7	7	7	7	7	9	9	9	9	9
34	4	4	4	4	4	2	5	6	5	4
35	2	3	3	3	3	4	4	5	3	3
36	3	2	2	2	2	1	1	1	1	1
37	1	1	1	1	1	3	2	4	2	1
38	8	8	9	9	8	5	6	6	6	7
39	6	5	5	5	5	8	8	8	8	6

Table 7.3.5.2: Rank in concentration based on employment according to the various measures used for two-digit manufacturing industries - 1972.

Industry number	Concentration ratio				Lorenz curve			Integration on the Lorenz curve	Rank on average
	10	50	70%	80%	10%	25%	50%		
31	6	6	6	7	3	3	3	3	4
32	8	8	8	8	7	6	1	6	6
33	7	7	7	6	8	8	7	8	9
34	4	2	2	2	2	2	4	2	2
35	3	4	4	3	5	5	4	5	3
36	2	3	3	5	6	7	8	7	5
37	1	1	1	1	1	1	2	1	1
38	9	9	9	9	4	4	6	4	7
39	5	5	5	3	9	9	9	9	8

Table 7.3.5.3: Rank in concentration based on fixed assets according to the various measures used, for two-digit manufacturing industries - 1972.

Industry Number	Concentration Ratio				Lorenz curve			Integration of the Lorenz curve	Rank on average
	10	50	70%	80%	10%	25%	50%		
31	7	7	8	8	7	6	6	7	7
32	9	8	7	7	5	5	4	5	5
33	5	6	6	6	8	8	8	8	6
34	4	4	4	4	4	4	5	4	4
35	2	3	2	2	3	2	2	2	2
36	3	2	3	3	2	2	3	3	3
37	1	1	1	1	1	1	1	1	1
38	8	9	9	9	6	7	7	6	9
39	6	5	5	5	9	9	9	9	8

Table 7.3.5.4 presents the ranks on average in concentration, grouped according to the three variables as displayed by the previous three tables. From these a final rank on average indicating rank in concentration is determined.

Table 7.3.5.4: Rank in concentration determined on average rank as indicated by all the measures grouped according to the three variables for two-digit manufacturing industries - 1972

Industry Number	Turnover*	Employment**	Fixed Assets***	Rank on Average
31	5	4	7	5
32	8	6	5	6
33	9	9	6	9
34	4	2	4	4
35	3	3	2	3
36	1	5	3	2
37	1	1	1	1
38	7	7	9	8
39	6	8	8	7

* From table 7.3.5.1., page 183

** From table 7.3.5.2., page 183

*** From table 7.3.5.3., page 184

From this table the basic metal industry, number 37, can undoubtedly be pointed out as the most concentrated in the South African manufac= turing industry. Many of the reasons for this are quite obvious and have already been discussed in the previous paragraphs. The second and third most concentrated industries are numbers 36 and 35,

respectively. The least concentrated industry is number 35.

7.4 COMPARING RANK ON STRUCUTRAL COMPONENTS AND RANK IN CONCENTRATION OF ECONOMIC POWER

In the first part of this chapter the share of each two-digit manufacturing industry in the four variables number of firms, turnover, employment, and fixed assets, was analysed. The second section contains an analysis of concentration of economic power measured against turnover, employment and fixed assets.

When the final results of these two approaches are compared, some interesting conclusions regarding the structural conditions in the manufacturing industry can be drawn. In Table 7.4 the rank on average of industries as indicated by the analysis of the structural components and on average according to concentration are compared.

It is notable that according to this table industry number 38, which has the largest average share of the four structural components is only eighth in line in concentration of economic power. This means that economic concentration is relatively low in this industry where 32,9 per cent of the total number of manufacturing firms, 28,2 per cent of total turnover, 27,8 per cent of employment and 17,0 per cent of total fixed assets are found.[10] The advantages and disadvantages of the concentration of economic power for the national economy were discussed in Chapter Two. When referring to almost the lowest concentration of economic power above, it should be borne in mind that the degree of concentration refers only to the South African situation. For this specific industry it still means that only 25 per cent of the firms, or 987

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10) See Table 7.2.5, page 173 of this study.

firms in that industry, control 89,7 per cent of the turnover, 85,0 per cent of the employment and 92,4 per cent of the fixed assets in that industry. [11)]

Table 7.4: Comparing rank on average for structural components and rank on average for concentration of economic power for two-digit manufacturing industries - 1972.

Industry Number	Structural rank on average from Table 7.2.5	Concentration rank on average from Table 7.3.5.4
31	2	5
32	3	6
33	8	9
34	7	4
35	4	3
36	6	2
37	5	1
38	1	8
39	9	7

The industry with the second largest average share in structural components, number 31, ranks fifth on concentration - the latter also being relatively low. In this instance 25 per cent, or 401 firms, control 9,1 per cent of turnover, 85,1 per cent of employment and 93,1 per cent of fixed assets in the industry.[12)]

11) Appendix 2, page 16.

12) Appendix 2, page 2.

7.5 CONCORDANCE IN RANKING ACCORDING TO THE DIFFERENT MEASURES AND VARIABLES EMPLOYED.

To be able to draw justifiable inferences from concordance in ranking as indicated by the various measures and variables, Kendall's coefficient of concordance W, [13] is applied to the data used in this chapter. [14]

The results of these statistical tests are outlined in Table 7.5.

Under the null hypothesis of independence between the various sets of rank distributions (meaning no actual agreement or concordance) the test statistic $m(n-1)W$ is approximately distributed as chi-square with $(n-1)$ degrees of freedom, where m is the number of rank orderings of $n(n>7)$. [15]

From this table it is clear that all the calculated W-values are significant at least at the five per cent level of significance. Therefore, the null hypothesis of independent rankings is rejected. This means that the calculated value of the test statistic indicates that there is sufficient reason to accept the hypothesis of significant concordance in the rankings according to

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13) Schumann, D.E.W., Bouwer, B., Schoeman, H.S., Elementêre Statistiek : Beskrywende Metodes, McGraw Hill, Johannesburg, 1974, pp. 169 - 170.

14) The significance of these coefficients is evaluated by means of the applicable chi-square test. For a comprehensive discussions of this test consult : Kendall, M.G., The advanced theory of statistics, Volume 1, Charles Griffin and Company, London, 1943, p. 420.

15) Ibid., p. 420.

Table 7.5: Kendall's coefficient of concordance and the ordinary chi-square test as applied to concentration data on a two-digit manufacturing industry classification.

Table reference	Testing concordance according to measures (M), or variables (V)	Kendall's coefficient of concordance, W.	Calculated values of Chi-square test statistic
7.2.5	V	0,683	21,86**
7.3.1 (10)	V	0,956	22,94*
7.3.1 (50)	V	0,963	23,11*
7.3.1 (70)	V	0,948	22,75*
7.3.1 (80)	V	0,923	22,15*
7.3.1 Turnover	M	0,979	31,33*
7.3.1 Employment	M	0,949	30,37*
7.3.1 Fixed assets	M	0,969	31,00*
7.3.1 All measures	V + M	0,932	89,47*
7.3.3.2 (10%)	V	0,800	19,20***
7.3.3.2 (25%)	V	0,764	18,34***
7.3.3.2 (50%)	V	0,710	17,04****
7.3.4	V	0,759	18,22***
7.3.5.1 (CR)	M	0,979	31,33*
7.3.5.1 (LC)	M	0,762	18,29***
7.3.5.1 All measures	M	0,752	54,14*
7.3.5.2 (CR)	M	0,949	30,37*
7.3.5.2 (LC)	M	0,825	19,80***
7.3.5.2 All measures	M	0,589	37,70*
7.3.5.3 (CR)	M	0,969	31,00*
7.3.5.3 (LC)	M	0,977	23,45*
7.3.5.3 All measures	M	0,830	53,12*
7.3.5.4	V	0,829	19,90***

* significant level of significance of 0,005
** " " " " 0,010
*** " " " " 0,025
**** " " " " 0,050

the various measures and variables used to determine the concentration of economic power.[16] Due to this feature the so-called "rank on average" was calculated in the various tables.

The rankorderings for which Kendall's coefficient of concordance in Table 7.5 were calculated is grouped according to either the different measures employed or the different variables as is indicated in the second column in the table. From these coefficients it can be inferred that there is not much difference in the rankings according to any one of the measures. It is noticeable, however, that the coefficients for the Lorenz curve measures are significant at a lower level of significance, except in the case of 7.3.5.3, than those for the concentration ratios. Despite the high level of significance associated with the coefficients of concordance for all the measures, direct comparison of the actual rankings according to the absolute and relative measures in the relevant tables revealed several differences.

There is also a significant level of concordance in the rankings according to the different variables. It is again noticeable that the coefficients of concordance for the variables according to the absolute measures are significant at a higher level of significance than for the relative measures.

From the analysis of these coefficients of concordance in Table 7.5 it thus seems that the absolute measures can be used interchangeably. The relative measures can also be used interchangeably. Even though there is a significant concordance in the rankings according to the absolute and relative measures, there are obviously several instances where there are differences in the specific ranking of industries. The analyst should, therefore, ascertain himself of the features of the different measures before he makes a final choice.

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16) An interpretation of the value of Kendall's coefficient of concordance can be given in terms of the average value of Spearman's rank correlation coefficient, r_s, over all possible pairs of rank orders, i.e.

$$\text{average } r_s = \frac{mW-1}{m-1}$$

The fact that $\frac{-1}{m-1} \leq \text{average } r_s \leq 1$ and $0 \leq W \leq 1$, makes the W values more comparable across different sets of data. For further discussion see Hays, W.L., Statistics, Holt, Rinehart and Winston, London, 1970, pp. 657 - 658.

7.6 SYNOPSIS

Chapter Seven contains a review of the distribution of the four structural components, number of firms, turnover, employment and fixed assets, amongst the nine two-digit industries in the manufacturing industry. It also deals with the concentration of economic power measured against three variables, on an extensive scale. The main conclusions to be drawn from this analysis are the following:

Firstly, the South African manufacturing industry is highly concentrated, as was indicated by all nine measures.

Secondly, the Basic Metal Industry, number 37, is by far the most concentrated of all nine two-digit industries. Industry number 36, Non-metallic Mineral Products and industry number 35 Chemicals and Chemical, Petroleum, Coal, Rubber and Plastic Products are the second and third-highest in concentration. All these are capital-intensive industries.

Thirdly, concentration indices based on the variable fixed assets, tend to indicate a higher level of concentration than the other two variables. Employment, which indicated the lowest level of concentration for the same industry, was still relatively high.

Fourthly, even though there seems to be a relatively high degree of concordance in concentration as indicated by two of the main types of concentration measures, namely the absolute and relative measures, there were exceptions as regards a few specific industries. The same type of measures, however, tended to indicate concentration of a similar nature.

Fifthly, the largest industry according to the structural components, industry number 38, is almost the least concentrated of the nine two-digit industries. This relatively low level of concentration, however, is still much higher than what is normally expected in a competitive market.

Sixthly, Kendall's coefficient of concordance indicates a significant positive relationship in the ranking of industries for all the measures and variables employed.

CHAPTER 8

THE STRUCTURE AND CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP, OR THREE-DIGIT INDUSTRY, BASIS - 1972

8.1 INTRODUCTION

In terms of the three-digit industry classification the manufacturing industry is divided into 30 three-digit industries.[1] The object of a three-digit classification of industries is to group together all those firms which are more closely related in activity than those included under the two-digit classification used in Chapter Seven. In Chapter Seven, industry no. 31 for example, consisted of Food, Beverages and Tobacco Products. On a three-digit basis these products are sub-divided into 311, Food Manufacturing; 312, Food Products not elsewhere classified; 313, Beverage Industries; and 314, Tobacco Products. It is thus a more homogeneous classification, grouping together fewer firms, but under more specific headings, such as for instance Food, Tobacco, Textiles, Wearing Apparel, Industrial Chemicals, Petroleum Refineries, Iron and Steel Basic Industries, Motor Vehicles, Parts and Accessories, etc.

Analysis of concentration of economic power at this three-digit level has also been used for an international comparison of economic concentration in this study.[2]

In this chapter the structure and the concentration of economic power in the manufacturing industry are analysed according to the various measures and variables outlined in Chapter Five.

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1) See Table 7.1, page 166 and Appendix 3, of this study.
2) See Chapter 10.

8.2 BASIC STRUCTURAL COMPONENTS

8.2.1 Distribution of firms

The distribution of firms on a three-digit industry basis is outlined in Table 8.2.1.1.

The two-digit industry, number 38, was found to have the most firms.[3] The three-digit industry with by far the largest number of firms is again found in industry number 38 namely, number 381. Once again this might be explained by the vast range of products included under this classification. It includes all types of manufacturing in the engineering field, except the few specifically excluded.

Second and third according to number of firms are Food Products, number 311, and Wearing Apparel except Footwear, number 322. Their individual shares differ with only 0,1 per cent and their rank is the opposite from that in the two-digit classification.[4]

Tobacco Products has the least number of firms, with only 15 firms in the whole industry.

According to Table 8.2.1.2 there are 18 industries which each have a share of not more than three per cent of the total number of firms. These 18 industries include only 2216 firms, or 18,3 per cent of the total number of firms. The largest industry includes 15,6 per cent of all firms, which means that there is a wide discrepancy in the distribution of the number of firms, the great majority of industries having a relatively small number of firms. This analysis, however, does not take the relative sizes of industries or firms into account; for this purpose Table 8.2.5 must be consulted.

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3) See Table 7.2.5, page 173 of this study.

4) Ibid.

Table 8.2.1.1: Distribution of firms on a three-digit industry basis in the South African manufacturing industry - 1972

Industry	Number of firms	Percentage of firms	Rank
311	1 195	9,9	2
312	160	1,3	17
313	233	1,9	15
314	15	0,1	30
321	518	4,3	11
322	1 189	9,8	3
323	207	1,7	16
324	120	1,0	21
331	532	4,4	9
332	643	5,3	7
341	137	1,2	18
342	844	7,0	5
351	123	1,0	20
352	354	2,9	13
353	23	0,2	29
354	30	0,3	28
355	61	0,5	25
356	248	2,0	14
361	37	0,3	27
362	39	0,3	26
369	666	5,5	6
371	134	1,1	19
372	88	0,7	24
381	1 889	15,6	1
382	877	7,2	4
383	443	3,7	12
384	530	4,4	10
385	113	0,9	22
386	94	0,8	23
390	563	4,7	8
	12 105	100,0	

Table 8.2.1.2: Frequency distribution of firms amongst the 30 three-digit manufacturing industries - 1972

Percentage share of total number of firms	Number and percentage of industries		Number and percentage of firms	
	No.	%	No.	%
0 - 3	18	60,0	2 216	18,3
3,1 - 6	7	23,3	3 895	32,2
6,1 - 9	2	6,7	1 721	14,2
9,1 - 12	2	6,7	2 384	19,7
12,1 +	1	3,3	1 889	15,6
	30	100,0	12 105	100,0

8.2.2 Distribution of turnover

The total turnover of R9 421,6 million in 1972 is distributed amongst the thirty three-digit industries as indicated in Table 8.2.2.1.

Industry 311 has the largest turnover with industries number 381 and 384 second and third, respectively. Industry 361 accounts for only 0,1 per cent of total turnover.

According to Table 8.2.2.2, 53,4 per cent of the industries (16 industries) each has less than 3,0 per cent of total turnover. The industry with the largest turnover has 12,6 per cent of total turnover, which emphasises the inequality of the distribution of turnover in manufacturing.

Table 8.2.2.2: Frequency distribution of turnover amongst the 30 three-digit manufacturing industries - 1972

Percentage share of turnover	Number of industries	Percentage of industries	Turnover	
			R'm	%
0 - 3	16	53,4	1 979,3	21,0
3,1 - 6	9	30,0	3 590,4	38,1
6,1 - 9	4	13,3	2 667,7	28,3
9,1 +	1	3,3	1 184,2	12,6
	30	100,0	9 421,6	100,0

Table 8.2.2.1: Distribution of turnover on a three-digit industry basis for the South African manufacturing industry - 1972.

Industry	Turnover (R'm)	Percentage	Rank
311	1184,2	12,6	1
312	192,1	2,0	17
313	467,7	5,0	7
314	191,5	2,0	18
321	583,2	6,2	5
322	332,6	3,5	12
323	47,9	0,5	27
324	103,0	1,1	25
331	145,9	1,6	20
332	132,5	1,4	21
341	311,9	3,3	14
342	273,5	2,9	15
351	349,2	3,7	11
352	408,4	4,3	9
353	373,4	4,0	10
354	19,9	0,2	29
355	132,5	1,4	21
356	118,8	1,3	24
361	13,5	0,1	30
362	64,6	0,7	26
369	332,3	3,5	13
371	664,7	7,1	4
372	190,5	2,0	19
381	749,8	8,0	2
382	549,5	5,8	6
383	465,4	4,9	8
384	670,0	7,1	3
385	194,5	2,1	16
386	28,6	0,3	28
390	130,0	1,4	23
	9421,6	100,0	

8.2.3 Distribution of employment

The distribution of employment on a three-digit industry classification is outlined in Table 8.2.3.1. The Food industry, number 311, has the largest complement of employment, with industries 381 and 321 in second and third place, respectively.

Industry number 354, Miscellaneous Products of Petroleum and Coal, has the smallest number of employees, viz. 0,1 per cent of total employment.

According to Table 8.2.3.2, nineteen industries (63,3 per cent of the total), each accounts for three per cent or less of total employment. The industry with the largest percentage share has 10,9 per cent and the smallest only 0,1 per cent. This once again indicates that in employment the majority of industries are small compared to the few exceptionally large ones.

Table 8.2.3.2: Frequency distribution of employment amongst the 30 three-digit manufacturing industries - 1972

Percentage share of turnover	Number and percentage of industries		Employment	
	No.	%	No.	%
0 - 3	19	63,3	304 118	26,9
3,1 - 6	6	20,0	324 587	28,7
6,1 - 9	3	10,0	266 225	23,5
9,1 +	2	6,7	236 138	20,9
	30	100,0	1 131 068	100,0

8.2.4 Distribution of fixed assets

From the distribution of fixed assets in Table 8.2.4.1 it is clear that industry 371, Iron and Steel Basic Industries, has by far the largest complement (17,8 per cent) of manufacturing fixed assets. Second in line, industry 311, Food Pro-

Table 8.2.3.1 Distribution of employment on a three-digit industry basis for the South African manufacturing industry - 1972.

Industry	Employment	Percentage	Rank
311	123167	10,9	1
312	13057	1,2	23
313	24327	2,2	16
314	3728	0,3	29.
321	101781	9,0	3
322	92261	8,2	4
323	8429	0,8	26
324	24524	2,2	15
331	46529	4,1	10
332	25322	2,2	14
341	32305	2,9	13
342	33751	3,0	12
351	24275	2,1	17
352	36480	3,2	11
353	8559	0,8	25
354	1564	0,1	30
355	16233	1,4	20
356	15913	1,3	21
361	4083	0,4	27
362	9120	0,8	24
369	67591	6,0	6
371	72183	6,4	5
372	14553	1,3	22
381	112971	10,0	2
382	66720	5,9	7
383	49986	4,4	9
384	57551	5,0	8
385	23612	2,1	18
386	3956	0,3	28
390	16537	1,5	19
	1131068	100,0	

ducts, has only 10,4 per cent. Petroleum Refineries, 353, comes third with 8,8 per cent.

Table 8.2.4.2 indicates that 18 industries (60,0 per cent of all undustries) each has three per cent, or less, of total fixed assets. With the largest single share at 17,8 per cent, this once again shows that fixed assets in the manufacturing industry are very unevenly distributed amongst the various industries.

Table 8.2.4.2: Frequency distribution of fixed assets amongst the 30 three-digit manufacturing industries - 1972

Percentage share of fixed assets	Number of industries	Percentage	Fixed assets	
			R'm	%
0 - 3	18	60,0	592,7	18,3
3,1 - 6	7	23,4	999,2	31,0
6,1 - 9	3	10,0	728,2	22,5
9,1 - 12	1	3,3	337,2	10,4
12,1 +	1	3,3	575,0	17,8
	30	100,0	3 232,3	100,0

8.2.5 A comparative review of structural components

The concordance of ranking according to the four structural variables was statistically determined. According to Kendall's coefficient of concordance there is a significant degree of concordance in the rankings according to all four measures.[5] Due to this property the so-called "rank on average" was calculated in several of the ensuing tables.

5) See Table 8.6, page 228 of this study.

Table 8.2.4.1: Distribution of fixed assets on a three-digit industry basis for the South African manufacturing industry - 1972.

Industry	Fixed assets (R'm)	Percentage	Rank
311	337,2	10,4	2
312	34,7	1,1	19
313	138,0	4,3	9
314	9,8	0,3	26
321	182,7	5,7	6
322	30,4	0,9	21
323	6,3	0,2	28
324	12,0	0,4	24
331	59,2	1,8	16
332	18,5	0,6	23
341	160,6	5,0	7
342	74,7	2,3	15
351	207,1	6,4	5
352	83,8	2,6	13
353	284,4	8,8	3
354	5,5	0,2	30
355	43,6	1,4	18
356	32,3	1,0	20
361	5,6	0,2	29
362	21,2	0,7	22
369	236,7	7,3	4
371	575,0	17,8	1
372	112,6	3,5	12
381	153,3	4,7	8
382	116,9	3,6	11
383	79,6	2,5	14
384	135,1	4,2	10
385	55,7	1,7	17
386	8,0	0,3	27
390	11,8	0,4	25
	3232,3	100,0	

Table 8.2.5: Comparison of rank of industries according to the structural components in the South African manufacturing industry on a three-digit industry basis - 1972

Industry	Number of firms % [6]	Rank	Turnover % [7]	Rank	Employment % [8]	Rank	Fixed assets % [9]	Rank	Rank on average
311	9,9	2	12,6	1	10,9	1	10,4	2	1
312	1,3	17	2,0	17	1,2	23	1,1	19	20
313	1,9	15	5,0	7	2,2	16	4,3	9	11
314	0,1	30	2,0	18	0,3	29	0,3	26	27
321	4,3	11	6,2	5	9,0	3	5,7	6	3
322	9,8	3	3,5	12	8,2	4	0,9	21	8
323	1,7	16	0,5	27	0,8	26	0,2	28	25
324	1,0	21	1,1	25	2,2	15	0,4	24	24
331	4,4	9	1,6	20	4,1	10	1,8	16	15
332	5,3	7	1,4	21	2,2	14	0,6	23	16
341	1,2	18	3,3	14	2,9	13	5,0	7	13
342	7,0	5	2,9	15	3,0	12	2,3	15	11
351	1,0	20	3,7	11	2,3	17	6,4	5	14
352	2,9	13	4,3	9	3,2	11	2,6	13	10
353	0,2	29	4,0	10	0,8	25	8,8	3	17
354	0,3	28	0,2	29	0,1	30	0,2	30	30
355	0,5	25	1,4	21	1,4	20	1,4	18	23
356	2,0	14	1,3	24	1,3	21	1,0	20	22
361	0,3	27	0,1	30	0,4	27	0,2	29	29
362	0,3	26	0,7	26	0,8	24	0,7	22	26
369	5,5	6	3,5	13	6,0	6	7,3	4	5
371	1,1	19	7,1	4	6,4	5	17,8	1	5
372	0,7	24	2,0	19	1,3	22	3,5	12	21
381	15,6	1	8,0	2	10,0	2	4,7	8	2
382	7,2	4	5,8	6	5,9	7	3,6	11	4
383	3,7	12	4,9	8	4,4	9	2,5	14	9
384	4,4	10	7,1	3	5,0	8	4,2	10	7
385	0,9	22	2,1	16	2,1	18	1,7	17	18
386	0,8	23	0,3	28	0,3	28	0,3	27	28
390	4,7	8	1,4	23	1,5	19	0,4	25	19
	100,0		100,0		100,0		100,0		

6) From Table 8.2.1.1, page 195.
7) From Table 8.2.2.1, page 197.
8) From Table 8.2.3.1, page 199.
9) From Table 8.2.4.1, page 201.

From this rank on average it can be stated that on average the Food industry, number 311, plays the largest part in manufacturing when measured in terms of number of firms, turnover, employment, and fixed assets. On the same basis Fabricated Metal Products except Machinery and Equipment, industry number 381, is second largest, with Textiles, number 321, third.

The smallest industry according to this average is number 354, Miscellaneous Products of Petroleum and Coal.

8.3 CONCENTRATION OF ECONOMIC POWER

Eight measures of concentration of economic power are applied in the three-digit classification level of the manufacturing industry. Five of these are absolute measures, one is a summary measure, and the remaining two are relative measures. The results of each measure are discussed and the rank in concentration indicated accordingly.

8.3.1 The common concentration ratio

The measures of the common concentration ratio are based on three variables, viz. turnover, employment and fixed assets. From section 8.6 it is clear that there is a significant degree of agreement in the applicable rankings according to all three variables. There are a few cases, however, in which there are differences in the indices for a specific industry. It seems that concentration, measured on fixed assets, tends to indicate a higher level of concentration than turnover and employment in the same industry.

Appendix 3[10)] contains the indices for the measures applied in this section. Rank in concentration according to these measures is outlined in Table 8.3.1.

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10) Appendix 3: Concentration indices for three-digit manufacturing industries in South Africa - 1972.

Table 8.3.1: Rank in concentration according to the concentration ratio measures for three-digit manufacturing industries - 1972

Industry	Turnover				Employment				Fixed Assets				Rank on Average
	3	10	70 %	80 %	3	10	70 %	80 %	3	10	70 %	80 %	
311	28	28	28	28	28	28	28	28	30	29	27	27	28
312	17	16	16	15	18	18	15	15	19	19	18	17	16
313	8	9	9	9	11	12	12	14	13	13	13	15	12
314	1	1	1	1	1	1	1	1	1	1	1	1	1
321	24	24	22	22	20	22	21	21	27	27	24	23	23
322	30	30	29	29	29	30	29	29	28	30	29	29	30
323	20	19	17	17	22	19	16	16	20	17	13	13	17
324	15	15	15	16	14	13	13	12	15	15	16	15	14
331	23	25	25	24	26	27	23	22	23	22	23	22	24
332	21	23	26	25	23	25	26	25	21	23	25	26	24
341	14	14	14	14	15	14	13	12	11	11	10	11	13
342	19	21	23	26	19	20	25	26	17	20	22	24	21
351	10	11	10	12	10	10	10	10	9	12	12	12	11
352	16	18	20	20	13	16	18	18	16	18	19	20	18
353	3	22	2	2	3	2	2	2	3	2	4	3	2
354	11	6	6	6	9	6	6	6	14	10	10	10	9
355	5	5	4	4	7	4	4	4	7	3	7	5	4
356	25	22	20	18	25	23	20	19	25	24	21	21	22
361	9	4	5	5	8	5	5	5	10	5	8	8	7
362	2	3	2	2	2	3	2	2	5	4	4	4	3
369	22	20	18	18	21	21	22	24	12	14	17	17	19
371	4	8	6	8	4	9	9	9	2	6	1	1	5
372	13	12	12	10	12	11	11	11	8	8	8	9	10
381	27	29	30	30	27	29	30	30	24	28	30	30	29
382	29	27	27	27	24	24	27	27	26	26	28	28	27
383	18	17	19	21	17	17	19	20	22	21	20	19	20
384	12	13	13	13	16	15	17	17	18	16	13	13	15
385	6	7	6	7	6	8	6	6	6	7	4	5	6
386	7	10	10	10	5	7	6	6	4	9	1	5	8
390	26	26	24	23	30	26	24	23	29	25	26	25	26

From this table it is clear that the Tobacco industry, number 314, is by far the most concentrated three-digit industry. It is ranked as such by all four measures, employing all three variables. Unlike the position obtaining in France,[11] the Tobacco industry in South Africa is not under State ownership. This high level of concentration becomes evident when the three firm ratios of 98,4 per cent, 88,12 per cent and 94,53 per cent for turnover, employment and fixed assets, respectively,[12] are considered.

On average, industry number 353, Petroleum Refineries, is indicated as being the second most concentrated three-digit industry.[13]

Running third is industry number 362, Glass and Glass Products. It is general knowledge that South Africa has mainly one very large manufacturer of glass and glass products. This is also explained by the high three-firm ratio according to all three variables.

The least concentrated industry, according to the concentration ratios, is industry number 322, Manufacturing of Wearing Apparel, except Footwear. When one considers this industry's rank according to structural components,[14] which is relatively high, then it is clear that this is one fairly large area in the manufacturing industry where there seems to be ample competition. Correspondingly, the concentration indices for this industry are relatively low for all variables.[15]

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11) George, K.D., and Ward, T.S., The structure of industry in the E.E.C. An International Comparison, Cambridge University Press, London, 1975, page 21.

12) Appendix 3, page 1.

13) Ibid, page 1.

14) See Table 8.2.5, page 202 of this study.

15) See Appendix 3, page 3.1 of this study.

8.3.2 The concentration curve

The concentration curves for the three-digit industries are included in Appendix 4, based on all three variables for each industry. Because of the large number of industries and related curves it is impossible to place them all on the same diagram. However, since the same scale is used in all the graphs, direct comparison between industries is still possible.

Keeping in mind that the shorter and steeper the curve, the higher the level of concentration,[16] several of the three-digit industries must be singled out as being extremely highly concentrated. They are, for example, industries 314, (Tobacco Products), 353 (Petroleum Refineries), 354 (Miscellaneous Products of Petroleum and Coal), 361 (Pottery, China and Earthenware) and 362 (Glass and Glass Products).[17]

A feature of the concentration curves is that the order in the level of concentration in each individual industry, according to the three variables, is identical in more than eighty per cent of the industries. Fixed assets frequently indicates the highest level of concentration of economic power in the same industry. Turnover lies mostly between fixed assets and employment, and employment usually indicates the lowest level of concentration. This corresponds with the findings on the Lorenz curve for the two-digit industries.[18]

Since so many industries are involved it is difficult to discuss the focal point (that number of firms where the economic power starts to become more evenly spread amongst firms), for each individual industry. This point varies between a low of two firms in the Tobacco industry, number

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16) See Chapter 4.6.1.1, page 108.

17) Appendix 4, pp. 1, 27, 33, 38.

18) See 7.3.3, page 178 of this study.

314,[19] and eighty and 100 firms in industries numbers 381 and 382, respectively, (Fabricated Metal Products except Machinery and Equipment; and Machinery, Except Electrical).[20]

8.3.3 The Lorenz curve

The Lorenz curves for the three-digit manufacturing industries and the statistical data on which they are based are included in Appendix 4. Although the absolute concentration of industries cannot be compared on this data, the comparison of relative concentration gives some insight into the structure of the various industries.

To simplify the comparison of relative concentration, as was indicated by the Lorenz curves in Appendix 4, Tables 8.3.3.1 to 8.3.3.3 are presented. In these three tables relative concentration for all three variables are compared at four levels of the cumulative number of firms namely the 10, 25, 50 and 75 per cent levels. It is thus possible to compare all the three-digit industries at the same cumulative firm level for each variable.

In an attempt to determine some final indication of the rank in relative concentration, Table 8.3.3.4 shows the rank of each industry according to all three variables. Justification for determining the rank on average for these industries (i.e. the ranking nearest to the given rankings) is found in Kendall's coefficients of concordance for the different sets of rankings. The coefficient varies between 0,727 and 0,893 for the variables and is 0,714 for all 12 of the rankings.[21]

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19) See Appendix 4, page 1.
20) Ibid., page 47.
21) See Table 8.6, page 228 of this study.

Table 8.3.3.1: Relative concentration based on turnover of the largest firms on a three-digit industry basis - 1972

INDUSTRY NUMBER	PERCENTAGE OF LARGEST FIRMS			
	10%	25%	50%	75%
311	72,10	90,36	97,56	99,61
312	59,88	86,83	96,83	99,33
313	82,10	90,36	90,40	99,57
314	91,97	98,99	99,90	100,00
321	62,42	85,34	96,68	99,46
322	64,35	88,14	97,68	99,57
323	48,57	76,89	93,00	98,50
324	54,46	78,83	94,46	99,21
331	58,38	80,41	93,78	98,32
332	63,41	84,35	95,65	99,07
341	60,49	84,50	96,12	99,28
342	71,22	85,67	95,12	98,93
351	72,64	88,66	97,80	99,77
352	65,92	86,54	96,27	99,28
353	76,72	93,35	99,51	99,93
354	40,68	74,79	93,56	98,00
355	82,03	91,52	96,97	98,94
356	55,11	78,94	92,92	98,45
361	44,87	89,15	96,32	99,17
362	77,16	92,08	96,86	98,06
369	80,43	91,60	97,32	99,26
371	78,85	92,05	97,86	99,53
372	63,06	87,02	96,82	99,30
381	69,71	86,27	95,76	99,21
382	67,10	85,69	95,56	98,81
383	72,84	89,26	97,32	99,63
384	86,50	94,05	98,54	99,34
385	83,48	94,95	98,69	99,63
386	71,04	87,28	95,87	99,33
390	62,34	84,75	95,53	99,10

Table 8.3.3.2: Relative concentration based on employment of the largest firms on a three-digit industry basis 1972

INDUSTRY NUMBER	PERCENTAGE OF LARGEST FIRMS			
	10%	25%	50%	75%
311	66,47	85,65	95,49	98,95
312	49,23	78,81	93,22	98,15
313	69,95	84,57	94,42	98,22
314	79,10	91,17	98,18	99,57
321	63,32	84,04	95,58	99,22
322	61,87	85,55	97,90	99,98
323	41,54	68,42	88,11	97,12
324	53,18	78,84	93,60	98,82
331	52,35	77,58	94,05	98,66
332	54,74	78,39	92,76	98,13
341	53,58	78,72	92,98	97,32
342	65,67	81,50	93,14	98,50
351	67,05	86,56	96,27	99,22
352	64,16	84,29	95,34	98,94
353	74,65	90,02	98,22	99,51
354	43,61	70,82	87,79	95,72
355	70,39	86,09	95,61	98,81
356	47,62	72,00	89,02	99,20
361	45,75	81,12	92,97	98,26
362	77,87	91,94	96,63	98,32
369	62,43	79,80	92,29	97,90
371	78,34	89,74	96,58	99,13
372	58,28	80,22	93,60	98,44
381	63,60	82,01	93,86	98,43
382	63,51	82,37	94,17	98,30
383	66,91	85,50	95,55	98,90
384	76,65	88,86	95,63	98,79
385	81,62	93,64	98,24	99,43
386	64,67	80,59	90,32	94,77
390	54,37	76,27	91,59	97,85

Table 8.3.3.3: Relative concentration based on fixed assets on a three-digit industry basis 1972.

Industry number	Percentage of largest firms			
	10%	25%	50%	75%
311	80,24	93,71	98,31	99,72
312	66,44	89,44	98,68	99,40
313	78,33	89,44	97,32	99,52
314	87,65	97,64	99,73	100,00
321	71,02	91,73	98,66	99,93
322	71,71	88,27	96,96	99,07
323	70,00	88,29	96,36	99,20
324	67,34	83,32	94,36	99,02
331	75,01	90,16	97,61	99,52
332	70,08	86,12	95,75	99,17
341	79,06	91,54	97,05	98,44
342	78,28	89,39	96,59	99,29
351	81,09	95,35	99,33	99,86
352	79,47	93,46	98,71	99,87
353	81,70	98,75	99,86	99,98
354	41,93	73,85	93,04	98,46
355	77,98	92,62	98,31	99,50
356	60,40	83,41	95,50	99,20
361	51,36	92,79	97,79	99,35
362	77,16	96,88	99,08	99,36
369	90,93	96,52	98,77	99,55
371	95,13	98,04	99,49	99,88
372	84,60	96,19	99,24	99,89
381	75,78	88,55	96,40	99,34
382	73,04	88,19	95,38	97,72
383	83,59	93,87	98,22	99,36
384	89,94	95,28	98,33	99,63
385	91,45	97,86	99,57	99,98
386	86,43	93,18	96,95	98,59
390	66,88	83,50	94,71	99,09

Table 8.3.3.4: Ranking of three-digit industries according to relative concentration on the Lorenz curve at four Levels for three variables - 1972

Industry number	Turnover				Employment				Fixed assets				Rank on average
	10	25	50	75	10	25	50	75	10	25	50	75	
311	12	9	8	6	11	9	12	9	11	11	13	9	7
312	24	17	13	13	26	22	20	23	27	19	10	15	20
313	4	9	30	7	8	12	14	22	14	19	18	12	16
314	1	1	1	1	2	3	3	2	5	4	2	1	1
321	21	22	15	10	17	14	10	5	22	16	11	4	14
322	18	14	7	7	19	10	4	1	21	24	20	25	15
323	28	29	28	26	30	30	29	28	24	23	24	21	29
324	27	28	25	18	24	23	18	12	25	29	29	26	26
331	25	26	26	28	25	26	16	15	19	18	17	12	23
332	19	25	21	22	21	25	24	24	23	26	25	23	25
341	23	24	18	15	23	24	22	27	13	17	19	29	24
342	13	21	24	24	12	17	21	16	15	21	22	20	19
351	11	13	6	3	9	7	7	5	10	8	5	8	6
352	17	18	17	15	14	13	13	10	12	12	8	7	11
353	9	4	2	2	6	4	2	3	9	1	1	2	3
354	30	30	27	30	29	29	30	28	30	30	30	28	30
355	5	8	11	23	7	8	9	13	16	15	13	14	10
356	26	27	29	27	27	28	28	7	28	28	26	21	28
361	29	12	16	20	28	18	23	21	29	14	16	18	21
362	8	5	12	29	4	2	5	19	17	5	7	16	9
369	6	7	9	17	18	21	25	25	3	6	9	11	12
371	7	6	5	9	3	5	6	8	1	2	4	6	4
372	20	16	14	14	20	19	18	17	7	7	6	5	13
381	15	19	20	18	15	16	17	18	18	22	23	19	18
382	16	20	22	25	16	15	15	20	20	25	27	30	22
383	10	11	9	4	10	11	11	11	8	10	15	16	8
384	2	3	4	11	5	6	8	14	4	9	12	10	5
385	3	2	3	4	1	1	1	4	2	3	3	2	2
386	14	15	19	12	13	20	27	30	6	13	21	27	17
390	22	23	23	21	22	27	26	26	26	27	28	24	27

Industry number 314, Tobacco Products, ranks the highest on relative concentration. This corresponds with the finding according to the concentration ratios in section 8.3.2. It is significant to notice that only three firms control at least 98,40 per cent, 88,12 per cent and 94,53 per cent of turnover, employment and fixed assets, respectively.[22] Even though there are still 12 more firms in that industry, their relative share of the market is so small that describing this industry as being oligopolistic does not represent a true picture of its structure.

The second most concentrated industry, according to Table 8.3.3.4, is number 385, Transport Equipment except Motor Vehicles, Parts and Accessories. In this instance six firms control 69,32 per cent, 68,86 per cent and 83,92 per cent of turnover, employment and fixed assets, respectively.[23] This market structure resembles that of oligopoly, since there are relatively few firms that control a major share of that industry.

Petroleum Refineries, industry number 353, is third in line while Iron and Steel Basic Industries, number 371, rates fourth.

Miscellaneous Products of Petroleum and Coal, industry number 354, is the least concentrated. In this instance there are three firms controlling 40,68 per cent, 43,61 per cent and 41,93 per cent respectively, of turnover, employment and fixed assets. If this is the position in the least concentrated three-digit industry, as analysed by means of the Lorenz curve, then the inference can be drawn that the South African manufacturing industry is highly concentrated.

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22) See Appendix 4, page 8.

23) Ibid., page 57.

8.3.4 Integration on the Lorenz curve

The closer this index approximates one, the more concentrated the particular industry. The indices compiled by means of integration on the Lorenz curves, are portrayed in Table 8.3.4. Accordingly, the lowest concentration is found in industries 354, 323 and 354, in terms of turnover, employment and fixed assets, respectively. The highest degree of concentration according to this measure is found in industries 314, 385 and 371, on turnover, employment and fixed assets, respectively. As was pointed out in previous paragraphs there are several reasons why these industries are relatively highly concentrated. These indices are also of assistance when the various Lorenz curves are to be compared.

Expressing economic concentration for the entire manufacturing industry as the average of all the integration indices, it is clear that, on average, very high concentration prevails. Indices of 0,7810, 0,7285 and 0,8277, based on turnover, employment and fixed assets, respectively, are indicative of high concentration. The same high trend in concentration is also indicated by the averages based on a one and two-digit industry classification.[24)]

The rank in concentration according to the integration indices, based on all three variables are also included in this table. It contains the rank on average for each industry, as calculated from the rankings according to the three variables. Justification for determining the rank on average for these industries (i.e. the ranking nearest to the given rankings) is found in Kendall's high coefficients of concordance of 0,857 between the different sets of rankings.[25)]

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24) See Tables 7.3.4, page 181 ; and 9.8.4.1, page 261

25) See Table 8.6, page 288 of this study.

Table 8.3.4: Concentration indices derived from integration on the Lorenz curve for three-digit manufacturing industries - 1972.

Number	Turn-over	Rank	Employ-ment	Rank	Fixed assets	Rank	Rank on average
311	.8144	9	.7630	11	.8567	12	11
312	.7566	21	.6718	26	.7956	22	23
313	.8444	5	.7620	12	.8319	14	10
314	.8956	1	.7990	6	.8591	11	4
321	.7590	20	.7500	14	.8218	18	19
322	.7822	14	.7682	8	.7992	21	16
323	.6660	29	.5775	30	.7846	23	28
324	.7010	27	.6884	20	.7535	28	25
331	.7084	26	.6840	22	.8229	17	22
332	.7529	22	.6837	23	.7801	25	24
341	.7489	24	.6748	25	.8308	15	21
342	.7810	16	.7351	15	.8278	16	17
351	.8118	10	.7782	7	.8746	6	6
352	.7737	17	.7553	13	.8599	10	13
353	.8057	12	.8042	5	.8209	19	12
354	.6390	30	.5787	29	.6401	30	30
355	.8308	7	.7667	10	.8421	13	9
356	.6893	28	.6140	28	.7399	29	29
361	.7331	25	.6753	24	.7743	26	25
362	.8208	8	.8210	3	.8694	7	4
369	.8412	6	.7096	19	.9085	3	7
371	.8495	4	.8299	2	.9415	1	2
372	.7731	18	.7106	18	.8873	5	14
381	.7815	15	.7323	16	.8138	20	18
382	.7655	19	.7312	17	.7833	24	20
383	.8118	10	.7673	9	.8646	9	7
384	.8824	2	.8106	4	.9042	4	3
385	.8706	3	.8592	1	.9212	2	1
386	.7899	13	.6848	21	.8682	8	15
390	.7508	23	.6681	27	.7543	27	27
Average	.7810		.7285		.8277		

Based on rank on average, industry number 385, Transport Equipment except Motor Vehicles, Parts and Accessories, is the most concentrated three-digit manufacturing industry. Second and third most concentrated are industries 371, Iron and Steel Basic Industries, and 384, Motor Vehicles, Parts and Accessories, respectively.

The least concentrated industry, based on the same data, is number 354, Miscellaneous Products of Petroleum and Coal. Industry number 356, Plastic Products not Elsewhere Classified, rates as having the second-lowest concentration.

8.3.5 The Horvath comprehensive measure of concentration

The comprehensive measure of concentration developed by Janos Horvath[26] is also applied on the three-digit industry classification.

Near-monopoly or oligopolistic industrial structures are associated with the dominance of the few largest firms.[27] This measure includes the absolute share of the largest firm in an industry and can be regarded as one of the more reliable measures for identifying monopolistic industries.

Table 8.3.5 reflects the index as well as the rank in concentration according to the Horvath index compiled on turnover data. Accordingly industry 314, Tobacco Products, is the most concentrated, with industry 362, Glass and Glass Products, and industry 353, Petroleum Refineries, rate second and third, respectively. Industry 322, Wearing Apparel, Except Footwear, is the least concentrated.

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26) See 4.6.2.2, page 114 of this study.

27) Bain, J.S., Industrial Organisation, op. cit., p. 27.

Table 8.3.5: Concentration of economic power and rank in concentration for three-digit manufacturing industries based on the Horvath comprehensive measure of concentration applied on turnover data - 1972.

Industry number	Horvath index	Rank in concentration
311	0,0593	28
312	0,1476	19
313	0,2982	9
314	0,7828	1
321	0,0914	23
322	0,0499	30
323	0,1174	21
324	0,1662	15
331	0,0826	25
332	0,1611	16
341	0,2461	12
342	0,1334	20
351	0,2902	10
352	0,1575	18
353	0,5724	3
354	0,2892	11
355	0,3759	6
356	0,0722	26
361	0,3220	8
362	0,5847	2
369	0,0975	22
371	0,5026	4
372	0,2102	14
381	0,0722	26
382	0,0530	29
383	0,1576	17
384	0,2271	13
385	0,3517	7
386	0,3782	5
390	0,0835	24

8.3.6 A comparative review of the results obtained by the various measures

Several absolute and relative measures as well as a summary measure of concentration were employed to determine concentration of economic power in the three-digit industry classification. In Table 8.3.6 the results of the concentration ratios as well as the Lorenz curve are compared and from this comparison it is attempted to draw some final conclusion as to what seems to be the most likely rank in concentration in the three-digit industry classification.

The last column in the table, "Rank on average", represents the average rank in concentration according to the concentration ratios and Lorenz curves based on all three variables. Only the rank on average according to the concentration ratios and Lorenz curves are used to determine a final rank on average because they represent the two types of concentration measures based on all three variables in this analysis. The Horvath index was determined only on turnover data and could therefore not be included. Accordingly industry number 314, Tobacco Products, is the most concentrated three-digit industry. Four of the rank orderings singled out this industry as having the highest concentration, while the remaining two indicated a second-highest rating. With only 15 firms in the entire industry and the three largest dominating the market in terms of all three variables, this is not surprising.

The second most concentrated industry is shown to be number 353, Petroleum Refineries. There are only 23 firms in this industry, of which the three largest firms control 76,7 per cent of turnover. This is also a very capital-intensive industry, where the three largest firms own 81,7 per cent of all fixed assets. Indus-

Table 8.3.6: A comparison of rank in concentration of three-digit manufacturing industries, according to the various groups of measures employed

Industry number	Turnover		Employment		Fixed assets		Rank on Average
	C.R.*	L.C.**	C.R.*	L.C.**	C.R.*	L.C.**	
311	28	8	28	10	29	10	19
312	16	16	17	25	18	18	17
313	9	12	12	14	13	15	11
314	1	1	1	2	1	2	1
321	23	18	20	12	25	13	17
322	30	10	30	8	30	23	23
323	17	29	18	30	17	24	25
324	15	26	13	19	16	29	21
331	25	27	24	20	23	16	24
332	24	24	25	26	24	25	29
341	14	21	14	27	10	20	16
342	22	22	23	15	21	20	22
351	11	6	10	5	12	7	7
352	18	16	15	13	18	9	14
353	2	3	2	3	3	4	2
354	8	30	8	29	11	30	20
355	4	11	4	9	6	14	6
356	21	28	21	22	22	27	26
361	5	20	5	22	8	19	12
362	2	13	2	6	4	11	5
369	20	9	22	21	14	6	15
371	6	5	9	4	2	3	4
372	12	15	11	18	9	5	9
381	29	19	29	15	28	22	27
382	27	23	27	15	27	26	28
383	19	7	18	11	20	12	13
384	13	4	15	7	14	8	8
385	6	2	7	1	6	1	3
386	10	14	6	22	5	17	10
390	26	25	26	28	26	28	30

* Concentration ratio rank on average from Table 8.3.1, page 204.

** Lorenz curve rank on average from Table 8.3.3.4, page 211.

try number 385, Transport Equipment, except Motor Vehicles, Parts and Accessories, has the third-highest concentration. Since the 113 firms in this industry include ship and boat builders, manufacturers of railroad equipment, motor cycles and aircraft, a high degree of concentration must be expected. In South Africa the number of clients for these types of products is relatively low. It is therefore to be expected that relatively few large firms will dominate the market for such expensive type of products.

Industry number 371, Iron and Steel Basic Industries, is indicated as the fourth-highest in respect of concentration. The same explanation as given for the previous industry also applies in this instance. Government participation, economies of scale and high capital investment requirements are also relevant.

The least concentrated industry is number 390, Other Manufacturing Industries. As has been pointed out, this three-digit industry does not comprise related industries which makes interpretation of the concentration indices difficult.

8.4 COMPARING RANK ON STRUCTURAL COMPONENTS AND RANK IN CONCENTRATION OF ECONOMIC POWER.

The final rank according to structural components and concentration of economic power, as determined in the preceding paragraphs, is presented in Table 8.4.

From this table it is possible to compare on an ad hoc basis (i.e. for specific industries) concentration of economic power with the distribution of number of firms, turnover, employment and fixed assets. Some inferences regarding competition in the largest sectors of the economy can be drawn.

Table 8.4: Comparing final rank in respect of structural components and concentration of economic power for three-digit manufacturing industries - 1972.

Industry number	Rank on average for structural components from Table 8.2.5	Rank on average for concentration from Table 8.3.6
311	1	19
312	20	17
313	11	9
314	27	1
321	3	17
322	8	23
323	25	25
324	24	21
331	15	24
332	16	29
341	13	16
342	11	22
351	14	7
352	10	14
353	17	2
354	30	20
355	23	6
356	22	26
361	29	12
362	26	5
369	5	15
371	5	4
372	21	9
381	2	27
382	4	28
383	9	13
384	7	8
385	18	3
386	28	10
390	19	30

The Food Industry, number 311, has the largest average share of all the structural components. It is, however, only nineteenth in line when it comes to concentration of economic power. It can thus be said that the largest three-digit industry in South African manufacturing is relatively low in respect of concentration when compared to the other manufacturing industries. It must be borne in mind that relatively low concentration in the South African context still means a fairly high level of concentration when compared to other countries.

The second-largest industry in respect of structural components is industry number 381, Fabricated Metal Products, except Machinery and Equipment. This industry ranks only twenty-seventh in respect of concentration, which is fairly low.

The third-largest industry, number 321, Textiles, ranks seventeenth in respect of concentration. Industry number 382, Machinery, except Electrical ranks fourth in respect of structural components whilst having a relatively low concentration rating of twenty-eighth. The only industries ranking high in respect of both structural components and concentration are numbers 371, Iron and Steel Basic Industries, and 384, Motor Vehicle Parts and Accessories. They are placed in fifth and seventh place in respect of structure and in fourth and eigth place in respect of concentration.

From the foregoing the inference can be drawn that, on a three-digit classification, the four largest manufacturing industries are not among those most severely concentrated.

If this table is seen from the other angle, namely rank according to concentration, then industry number 314, Tobacco Products is shown to be the most concentrated

whilst enjoying a very low rating of twenty-seventh in respect of structural components. The second, third and fourth most concentrated industries, number 353, Transport Equipment, except Petroleum Refineries, 385, Motor Vehicles, Parts and Accessories, and number 371, Iron and Steel Basic Industries, rank seventeenth, eighteenth and fifth, respectively, in respect of structural components.

It is clear that here are many instances where the most concentrated industries rank relatively low in their share of the total manufacturing industry when the latter is measured as the average share of number of firms, turnover, employment and fixed assets. It cannot, however, be stated catagorically that there is a definite relationship between economic concentration and relative size of industries.

8.5 DISTRIBUTION OF INDUSTRIES ACCORDING TO LEVEL OF CONCENTRATION

Economic theory does not define absolute boundaries for polypoly and oligopoly. Therefore no level of concentration clearly indicates where oligopoly ends and polypoly begins. Grouping industries together according to their concentration ratios may, however, make it possible to shed some more light on these particular market structures as they occur in the South African economy.

Kaysen and Turner[28] distinguished three categories of concentration according to economic power held by the eight largest firms.

Their first category consisted of a "concentrated" group in which the share of the eight largest firms was at least 50 per cent. The second category comprised a "mid-

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28) See Blair, J.M., op. cit.. p. 11.

dle category" in which the eight-firm share was between 33 per cent and 49 per cent. The third category, namely an "unconcentrated category", included those industries in which the eight largest companies had less than a 33 per cent share.

Blair[29] adapted these categories to include the share of the four largest companies. The "concentrated industries", where the four largest firms account for 50 per cent or more of the output. The "moderately concentrated industries", where the four largest firms account for between 25 and 49 per cent of the output, and thirdly, the "unconcentrated industries", where the four-firm share is less than 25 per cent. Professor Brunt approached the classification differently and distinguished the following four categories:

"Highly concentrated industries: the largest four firms accounting for at least 50 per cent of total employment in each industry.

Fairly concentrated industries: the largest eight firms accounting for at least 50 per cent of total employment in each industry.

Slightly concentrated industries: the largest 20 firms accounting for at least 50 per cent of total employment in each industry.

Unconcentrated industries."[30]

It is difficult to single out a specific number of firms to indicate the beginning of oligopoly. Since three-firm concentration ratios are permitted in South Africa,

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29) See Blair, J.M., op. cit., p. 11.

30) Sheridan, K., "An Estimate of the Business Concentration of Australian Manufacturing Industries," The Economic Record, March, 1968, pp. 26 - 41.

which may be considered the beginning of oligopoly, the three-firm concentration ratio, based on all three variables, is employed in the following four categories of concentration developed for this study:

- Highly concentrated industries: where the three largest firms control at least 70 per cent of each variable in each industry;

- fairly concentrated industries: where the three largest firms control between 50 and 69 per cent of each variable in each industry;

- slightly concentrated industries: where the three largest firms control between 25 and 49 per cent of each variable in each industry, and finally

- unconcentrated industries: where the three largest firms control less than 25 per cent of each variable in each industry.

The data[31] for all three variables are used in Table 8.5.1 to portray the structure of the South African manufacturing industry according to the above categories.

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31) Data from Appendix 3.

Table 8.5.1: Distribution of three-digit manufacturing industries in four concentration categories according to the three-firm concentration ratio - 1972

Category	Distribution of three-digit industries					
	Turnover:		Employment:		Fixed assets:	
	Industries	%	Industries	%	Industries	%
1. Highly concentrated industries (70%+)	3	10,0	3	10,0	6	20,0
2. Fairly concentrated industries (50-69%)	5	16,8	3	10,0	4	13,4
3. Slightly concentrated industries (25-49%)	8	26,6	9	30,0	10	33,3
4. Unconcentrated industries (25%)	14	46,6	15	50,0	10	33,3
	30	100,0	30	100,0	30	100,0

According to this Table 73,2 per cent, or 22, of the South African manufacturing industries are either slightly concentrated or unconcentrated when judged on turnover. The industries concerned in these two groups account for 77,4 per cent of total manufacturing turnover.[32] Five three-digit industries, or 16,8 per cent of all the industries are labelled as being fairly concentrated if based on turnover. They comprise 15,9 per cent of total manufacturing turnover.[33]

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32) See Appendix 3 and Table 8.2.2.1, page 197 of this study.

33) Ibid.

Based on turnover there are three highly concentrated industries which represent 6,7 per cent of total manufacturing turnover. They are industries number 314, 353 and 362 and are also shown by the measures of concentration to be among the most concentrated industries.[34] These three industries have only 15, 23 and 39 firms each.[35] When only three firms control at least 70 per cent of such important structural variables as turnover, employment and fixed assets they must indeed be the trendsetters in their specific industries.

It must be borne in mind that a three-digit industry classification is still very broad and that the identification of a particular market structure should be interpreted with caution. When the identification of monopolistic market structure for purposes of implementing competition policy is at issue, a five-digit industry classification should be used.

When measured in terms of fixed assets, Table 8.5.1 shows six industries as being highly concentrated. These six represent 29,6 per cent of total manufacturing fixed assets.[36] They have between 15 and 134 firms, which mean that the majority of these firms are relatively small when compared to the largest three in each industry. Table 8.5.2 shows the relative size of these six industries in the entire manufacturing industry.

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34) See Table 8.3.6, page 218 of this study.
35) See Table 8.2.1.1, page 195 of this study.
36) See Table 8.2.4.1, page 201 and Appendix 3.

Table 8.5.2: Relative size in total manufacturing of the six highly concentrated industries measured in terms of fixed assets - 1972

Industries	Number of firms	Percentage share of turnover[37]	Percentage share of employment[38]	Percentage share of fixed assets[39]
314 Tobacco Products	15	2,0	0,3	0,3
353 Petroleum Refineries	23	4,0	0,8	8,8
362 Glass and Glass Products	39	0,7	0,8	0,7
371 Iron and Steel basic industries	134	7,1	6,4	17,8
385 Transport equipment except motor vehicles	113	2,1	2,1	1,7
386 Professional and scientific equipment	94	0,3	0,3	0,3
	418	16,2	10,7	29,6

8.6 CONCORDANCE IN RANKING ACCORDING TO THE DIFFERENT MEASURES AND VARIABLES EMPLOYED

In order to be able to draw statistically accountable conclusions regarding ranking as indicated by the various measures of concentration, and variables on which they were based, Kendall's coefficient of concordance,[40] W, is ap-

37) See Table 8.2.2.1, page 197.

38) See Table 8.2.3.1, page 199.

39) See Table 8.2.4.1, page 201.

40) Schumann, D.E.W., Bouwer, B., and Schoeman, H.S., op. cit., pp. 169 - 170.

Table 8.6: Kendall's coefficient of concordance and the value of the chi-square test statistic as applied to concentration data for three-digit manufacturing industries

Table reference	Testing concordance according to measures (M) and variables (V)	Kendall's coefficient of concordance, W	Calculated values of Chi-square test statistics
8.2.5	V	0,746	86,54*
8.3.1 (3)	V	0,965	87,97*
8.3.1 (10)	V	0,979	87,98*
8.3.1 (70%)	V	0,971	87,00*
8.3.1 (80%)	V	0,973	84,65*
8.3.1 Turnover	M	0,978	113,45*
8.3.1 Employment	M	0,972	112,75*
8.3.1 Fixed assets	M	0,967	112,17*
8.3.1 All measures	M+V	0,953	331,64*
8.3.3.4 (10%)	V	0,893	77,69*
8.3.3.4 (25%)	V	0,880	76,56*
8.3.3.4 (50%)	V	0,840	73,08*
8.3.3.4 (75%)	V	0,727	63,25*
8.3.3.4 Turnover	M	0,781	90,60*
8.3.3.4 Employment	M	0,825	95,70*
8.3.3.4 Fixed assets	M	0,838	97,21*
8.3.3.4 All measures	M+V	0,714	248,47*
8.3.4. All variables	V	0,857	74,56*
8.3.6 All measures	M+V	0,669	116,41*

* Significant at a level of significance of 0,005.

plied to the data analysed in this chapter.[41]

The values of W and the results of the statistical tests are outlined in Table 8.6. Under the null hypothesis of no agreement or concordance between the various sets of rankings (meaning no actual agreement or concordance) the test statistic $m(n-1)W$ is approximately distributed as chi-square with (n-1) degree of freedom, where m is the number of rank orderings of $n(n>7)$.[42] The null hypothesis is rejected in all case, which means that there is sufficient reason to accept the hypothesis of significant concordance in the rankings according to the various measures and variables used to determine the concentration of economic power.[43]

It is on the basis of the positive results of these tests that an attempt was made in the various tables to arrange the different industries according to the "rank on average" of the different measures.

The statistical significance of the coefficients of concordance in Table 8.6 suggests that all the measures as well as all the variables can be used interchangeably.

Comparison of the actual rank orders in Table 8.3.6, where the ranking according to the concentration ratios and the Lorenz curves are compared, shows several instances where there are substantial differences in ranking of a specific industry. Despite the high coefficient of concordance the analyst must make sure that he is aware of the features of each measure before he makes his final choice.

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41) The significance of these coefficients is evaluated by means of the applicable chi-square test. For a comprehensive discussion of this test consult Kendall, M.G., op. cit., p. 420.

42) Kendall, M.G., op. cit., p. 420.

43) See footnote 16 on page 190 of this study for a further interpretation of Kendall's coefficient of concordance.

8.7 SYNOPSIS

Chapter eight presents an analysis of the structure and concentration of economic power in the South African manufacturing industry on the basis of a three-digit industry classification. The distribution of the structural components, viz. number of firms, turnover, employment and fixed assets amongst the thirty three-digit industries was reflected. Concentration of economic power was determined by means of absolute, relative and summary measures of concentration. These measures were based on three variables, namely turnover, employment and fixed assets.

The main inferences to be drawn from the foregoing analysis are the following:

Firstly, ranked on average share of the four structural components, the Food Industry, number 311, is the most prominent in the manufacturing industry. Industries number 381, Fabricated Metal Products, except Machinery and Equipment, and number 321, Textiles, occupy the second and third place, respectively. The smallest industry in this connection is number 354, Miscellaneous Products of Petroleum and Coal.

Secondly, there is a high degree of agreement in the order of ranking amongst all four concentration ratio measures, based on all three variables. They also correspond remarkably with the Horvath comprehensive measure of concentration. Accordingly, the Tobacco industry, number 314, was time after time indicated as being the most concentrated. Industries number 353, Petroleum Refineries, and 362, Glass and Glass Products, are second and third, respectively. The least concentrated industry is number 322, Wearing Apparel, except Footwear.

Thirdly, there is a high degree of ranking concordance between the various relative measures of concentration. Their average ranking, based on all three variables. makes industry number 314, Tobacco Products, the highest concentrated.

Fourthly, when results of the concentration ratios and Lorenz curves are compared, industry number 314, Tobacco Products, is singled out as being the most concentrated three-digit manufacturing industry. The least concentrated industry is number 390, Other Manufacturing Industries. While there is a significant correlation between the results according to the absolute, relative and summary measures of concentration, especially at the higher levels of concentration, there are many industries where there is a difference between the absolute and summary measures on the one side. and the relative measures on the other. The latter is the case especially at the middle and lower levels of concentration.

Fifthly, there is a high degree of ranking concordance in the indices developed according to the same measures, based on all three variables within the same industry. Despite this significant concordance, the indices based on fixed assets indicated a slightly higher level of concentration in the same industry, while those based on turnover and employment were second and third, respectively.

Sixthly, the four largest industries, according to the structural analysis, are not amongst those industries with the highest degree of economic concentration. This, however, must be seen in the South African context, since the industries with the lowest level of concentration are still much higher concentrated than would be expected in a very competitive industry.

Seventhly, five of the six most highly concentrated industries, according to the three-firm concentration ratio,[43] were also pointed out by all three groups of concentration measures as being the most concentrated.[44] Whilst these six industries compirse only 3,4 per cent of all manufacturing firms, they control 16,2 per cent of manufacturing turnover, 10,7 per cent of manufacturing employment and 29,6 per cent of manufacturing fixed assets.

Eighthly, all measures of economic concentration employed in this chapter indicate a relatively high degree of concentration of economic power in the South African manufacturing industry.

For the purpose of implementing competition policy in a specific situation in a specified industry, a more detailed analysis of industrial structure and the concentration of economic power is necessary than what has been presented so far. With this aspect in mind, and also for the purpose of international comparison of economic concentration, a more detailed, five-digit industry analysis of the South African manufacturing industry is made in the next chapter.

CHAPTER 9.

CONCENTRATION OF ECONOMIC POWER AND STRUCTURE OF THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A SUB-GROUP OR FIVE-DIGIT INDUSTRY BASIS.

9.1 INTRODUCTION

A five-digit classification of industries is the most sensitive classification of industries on a national and international basis. According to this classification all firms that are engaged in similar activities are grouped together. When a firm is engaged in more than one of the fields distinguished in the classification it is grouped according to its main activity. In most circumstances, therefore it is possible to make a direct comparison between firms in the same classification.

When a detailed analysis of the market structure in a specific industry is to be made, the five-digit level will be the obvious level at which to do it. As for the identification of restrictive trade practices and of imperfect market structures, such as monopoly or oligopoly, this could hardly be done on any level other than a five-digit classification. On this basis specific firms in specific industries can be identified and their behaviour in that industry scrutinized.

Since this level of classification is used to identify market structures for the purpose of anti-trust legislation in the United States of America[1)] and for the analysis of industrial structure and concentration of economic power in many other countries, it is also an obvious level on which to make international comparisons. Even though a five-digit classification enables the identification of every firm in an industry, it does not provide for the identification of cross-holdings and conglomerate ownership. This means that where more than one firm is controlled by the same holding company, this fact is not revealed. However, this is a problem which can easily be overcome when a particular five-digit industry is analysed.

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1) Finkelstein, M.D., and Friedberg, R.M., op. cit., p. 678.

In this chapter a special attempt is made to identify the various market structures in the South African manufacturing industry in accordance with the classification provided by economic theory, based on the number of market parties.

The approach in this chapter differs from that in the previous two chapters, in that the 181 five-digit industries distinguished according to the SIC do not lend themselves to this type of analysis because of the large number of industries involved. The only measures of concentration employed in this chapter are the common concentration ratios and the Horvath comprehensive measure of concentration.

A comparison of concentration in wholesale and retail, construction and manufacturing is also included.

9.2 INDICES OF ECONOMIC CONCENTRATION

Only four variants of the common concentration ratio, viz. the three-firm and five-firm ratios and the number of firms accounting for 70 per cent and 80 per cent of turnover, employment and fixed assets, respectively, are applied to the five-digit classification of industries. The indices are included in Appendix 5.

The Horvath comprehensive measure of concentration[2] was also developed on a five-digit basis and is included in Appendix 5. Table 9.2.1 lists the twenty most concentrated manufacturing industries, with an annual turnover of at least R5,0 million, according to this measure. A remarkable correlation in rank is observed between the industries listed here and those listed in Table 9.7.2 according to the concentration ratio measures.

Because this measure takes into account the share of the largest firm in each industry, it can be regarded as a significant indicator of the structure of the various industries. The closer the index approximates unity, the more concentrated the industry.

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2) See 4.6.2.2, page 114 and 8.3.5, page 215 of this study.

Table 9.2.1: The 20 most concentrated five-digit manufacuring industries with a turnover of at least R5,0 million according to the Horvath comprehensive measure of concentration - 1972.

Rank in concentration	Number of industry	Title of category	Horvath index of concentration	Number of firms in industry
1	31132	Dried fruit packing	,9958	2
2	38291	Tractors - agricultural and others	,9404	6
3	35292	Matches	,9259	2
4	38550	Aircraft - manufacture and repair	,9047	13
5	35293	Explosives and ammunition	,8696	4
6	38391	Dry cell batteries	,8631	4
7	38540	Motor cycles, scooters, bicycles	,8336	10
8	36200	Sheet and plate glass, glass containers	,8244	12
9	31330	Breweries, except Bantu beer	,8111	3
10	31400	Cigarettes, cigars, tobacco, snuff	,7828	15
11	32150	Rope, cable, cordage, twine, etc.	,7797	12
12	31210	Flavouring essences	,7570	5
13	35110	Tanning extract	,7467	3
14	31150	Crude oil and oilseed cake and meal	,7174	5
15	38393	Electric bulbs and fluorescent tubes	,7157	6
16	37201	Precious metal refining	,7074	4
17	38402	Radiators	,7063	18
18	35120	Fertilizers	,7026	15
19	32113	Dyeing bleaching, printing, etc.	,6999	16
20	31161	Instant breakfast foods	,6724	5

9.3 SIZE DISTRIBUTION OF MANUFACTURING FIRMS

The analysis of the size distribution of the 12105 manufacturing firms is done by means of frequency distribution tables for the three variables, viz. turnover, employment and fixed assets. Besides being important in a consideration of concentration of economic power, these three variables are also critical when industrial size and structure are being analysed and discussed. The size distribution according to these variables is outlined in Table 9.3.

9.3.1 Distribution of turnover

Total manufacturing turnover of R9421,6 million is distributed amongst firms as indicated in Table 9.3.

By choosing the first interval so as to include all firms with a turnover of up to R0,5 million, more than 75 per cent of the total number of manufacturing firms is included. However, this major group of firms represents only 11,9 per cent of the total manufacturing turnover.

More than 97 per cent of all firms have an individual turnover of not more than five million rand and represent 50 per cent of the total manufacturing turnover. This points to the inequality of size distribution of firms in the manufacturing industry. Only 332 firms, i.e. 2,68 per cent, control the remaining 50 per cent of the total manufacturing turnover.

The most important group of firms, as far as their group share of the total turnover is concerned, is the group with a turnover of between R1,1 million and R5,0 million each. In this interval 1312 firms, or 10,84 per cent of all firms, control 29,5 per cent of total turnover. It is noteworthy that the fourteen largest firms, i.e. 0,11 per cent of all manufacturing firms, have a 12,8 per cent share of the total manufacturing turnover.

TABLE 9.3 SIZE DISTRIBUTION OF MANUFACTURING FIRMS - 1972

TURNOVER				EMPLOYMENT				FIXED ASSETS			
Interval (R'm)	Number of firms	Percentage of firms	Percentage of total turnover	Interval (Employees)	Number of firms	Percentage of firms	Percentage of total employees	Interval (R'm)	Number of firms	Percentage of firms	Percentage of total fixed assets
-0.5	9290	76,75	11,9	-5	2401	19,83	0,6	-0,5	11,384	94,04	14,9
0,5-1,0	1178	9,73	8,6	6-10	1744	14,41	1,2	0,51-1,0	310	2,56	6,8
1,1-5,0	1312	10,84	29,5	11-20	1935	15,99	2,5	1,1-5,0	312	2,58	21,1
5,1-10,0	177	1,46	12,8	21-50	2581	21,33	7,0	5,1-10,0	59	0,49	12,3
10,1-15,0	70	0,58	7,6	51-100	1400	11,57	8,7	10,1-20,0	23	0,19	9,3
15,1-20,0	23	0,19	4,1	101-250	1162	9,60	16,0	20,1-30,0	5	0,04	3,5
20,1-30,0	23	0,19	6,5	251-500	452	3,73	13,5	30,1-40,0	4	0,03	4,0
30,1-50,0	18	0,15	6,2	501-1000	257	2,12	15,4	40,1-50,0	1	0,01	1,3
50,1-100,0	10	0,08	6,4	1001-2000	107	0,88	13,0	50,1-75,0	2	0,02	3,3
100,1-200,0	3	0,02	3,4	2001-5000	55	0,45	13,6	75,1-100,0	3	0,02	8,3
200,1+	1	0,01	3,0	5001-10000	8	0,07	4,5	100,1-150,0	1	0,01	3,3
				10000+	2	0,02	4,0	150,1+	1	0,01	11,9
	12105	100,00	100,00		12105	100,00	100,0		12105	100,00	100,0

Table 9.3.1: Distribution of turnover of the three and five largest firms in each five-digit manufacturing industry - 1972

Three largest firms		Five largest firms		Three largest firms		Five largest firms		Three largest firms		Five largest firms	
25 Per cent of market				50 Per cent of market				75 Per cent of market			
Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%
155	85,6	168	92,8	105	58,0	134	74,0	53	29,3	82	45,3

The size distribution of the three and five largest firms in each industry is outlined in Table 9.3.1. Accordingly there are 53 industries in which the three largest firms control at least 75 per cent of the turnover of their industry, whereas the same can be said for 82 industries on a five-firm basis. At the other end the three largest firms in 155 industries and the five largest firms in 168 industries control at least 25 per cent of the turnover of their industry. These are formidable percentages if the aggregate concentrated economic power of these large firms in considered.

9.3.2 Distribution of employment

The distribution of total manufacturing employment of 1,131 million employees is also outlined in Table 9.3. The twelve frequency intervals are constructed to give as comprehensive an outline of employment distribution amongst firms as is possible within the framework of this study.

The largest number of manufacturing firms, 2581, employ between 21 and 50 employees each. This group, however, represents only seven per cent of the total manufacturing employment.

The second largest group of firms, 2401, with five, or fewer, employees each, represents only 0,6 per cent of the total manufacturing employment.

The three intervals falling between 101 and 1000 employees represent 1871 firms, employing 44,9 per cent of all manufacturing employees.

The 172 largest firms, with more than 1000 employees each, have a 35,1 per cent share of the total manufacturing employment.

It thus seems that as far as the distribution of employment is concerned, there is also a very high degree of inequality.

9.3.3 Distribution of fixed assets

Total investment in fixed assets of R3232,3 million is distributed amongst firms as set out in Table 9.3.

The first interval, with investment in fixed assets of up to R0,5 million per firm, represents 11384 firms, or 94,0 per cent of all manufacturing firms. This group, however, has only a 14,9 per cent share of the total investment in fixed assets. This unequal distribution corresponds with the observations based on turnover and employment.

The interval with the largest share of total fixed assets is the 312 firms with between R1,1 and R5,0 million each in fixed assets, representing 21,1 per cent of the total fixed assets.

There are 40 firms with more than R10,1 million invested in fixed assets. This small number of firms, however, have a 44,9 per cent share in total investment in fixed assets. The largest firm in terms of fixed assets has no less than 11,9 per cent of the total fixed assets, which is almost as much as the total share of the 11384 small firms in the interval with investment of up to R0,5 million.

The overwhelming majority of manufacturing firms in South Africa are thus relatively small as regards investment in fixed assets and also have a relatively small share in the total manufacturing fixed assets.

9.3.4 Resumé

When the size distribution of firms is analysed according to the three variables turnover, employment and fixed assets, the outstanding result of the analysis is the inequality of the size distribution of South African manufacturing firms.

Of all manufacturing firms 97,32 per cent have only a 50,0 per cent share in the total turnover, 93,73 per cent of the firms have a share of only 36,0 per cent of the total employment and 94,04 per cent of all the firms have a share of only 14,9 per cent of the total fixed assets.

This shows that the South African manufacturing industry consists of a very large proportion of small firms, while relatively few very large firms dominate the industry as a whole. It must, however, be kept in mind that no performance measures were taken into account. In point of profitability, efficiency and other performance measures, it may very well be the smaller firms that have greater justification for their existence. This, however, is an area which calls for further investigation.

The inequality of size distribution corresponds with the structural inferences drawn from comparable findings in the previous two chapters.

9.4 MARKET STRUCTURES (MONOPOLY, DUOPOLY, OLIGOPOLY OR POPYPOLY.)

Because of the inequality of firm sizes it is difficult to determine the precise boundaries in terms of the number of firms for many of the different market structures outlined in economic theory. It is, as has been said before, difficult to indicate precisely where oligopoly begins and ends and where polypoly begins. The market conduct of the leading firms in an industry should also be taken into consideration when attempting such indications.

Since there is a lack of sufficient knowledge regarding each individual five-digit industry and the behaviour of the relevant firms in South African conditions, market structures are identified in terms of the number of firms in each industry. In an effort to apply this to the South African manufacturing industry, all five-digit industries with five or fewer firms are identified in Table 9.4.1.

The last two columns in this table are included to give an indication of the relative size of the largest firms in these industries. From these the influence that they have on the relevant industries can be deducted. It does not necessarily follow, however, that when one firm has a dominant share in a specific industry its practices are necessarily designed to undermine free competition.

Table 9.4.1. Five-digit manufacturing industries with between 1 and 5 firms

Industry number	Title of category	Number of firms in industry	Percentage of turnover of the 3 largest firms	Number of firms with at least 70% of turnover
31112	Natural sausage casings; tallow dripping and lard	4	92,0	2
31132	Dried fruit packing	2	100,0	1
31150	Crude oil and oilseed cake and meal	5	98,5	2
31152	Whale oil	1	100,0	1
31161	Instant breakfast foods	5	90,2	2
31171	Macaroni, vermicilli and spaghetti	4	99,7	1
31210	Flavouring essences	5	95,8	2
31213	Yeast	5	83,2	3
31330	Breweries, except Bantu beer	3	100,0	1
32112	Fibreworking (animal and vegetable)	2	100,0	1
33112	Wattlebark grinding and compressing	5	92,3	1
35110	Tanning extract	3	100,0	2
35292	Matches	2	100,0	1
35293	Explosives and ammunition	4	99,4	1
35510	Manufacture of tyres and tubes	5	85,8	3
36202	Scientific and laboratory glassware, except grinding of optical lenses	4	98,1	1
37201	Precious metal refining on a fee or contact basis	4	92,9	2
38210	Manufacture of engines and turbines	3	100,0	1
38391	Dry cell batteries	4	97,7	1
39019	Other precious and semi-precious stone cutting and polishing	3	100,0	2
39092	Crayons, chalk, pens and pencils	5	81,2	3

However, since the potential for the abuse of economic power by such firms is present, the awareness of such a situation by the appropriate authorities and their keeping a watchful eye on the behaviour of such firms are justified.

In terms of the "Number of firms in industry" listed in Table 9.4.1., it is clear that there is only one textbook example of a monopoly in the South African manufacturing industry viz. number 31152, the production of Whale Oil. Since the date of the census taken in 1972, however, the production of Whale Oil has ceased in South Africa. In terms of absolute number of firms there are three textbook examples of duopoly in the manufacturing industry. If one assumes that oligopoly starts where there are at least three firms in an industry, then the remaining seventeen industries in this Table must be considered as being oligopolistic.

The above classification is based purely on the number of firms in an industry.

If the analysis is taken a step further so as to indicate the industries in which relatively few firms control at least 70 per cent of the total turnover, more examples of monopoly, duopoly and oligopoly can be singled out. This is done in the last two columns of Table 9.4.1. In the instances where only one firm controls at least 70 per cent of the relevant industry, the question may well be asked whether this is not a situation that can be described as monopolistic. Should the answer be in the affirmative then at least 11 manufacturing monopolies can be identified.

In practice it is even more difficult to distinguish between duopoly and oligopoly.

Industry 31210 (Flavouring Essences) may serve as an example. With only five firms in the industry, oligopolistic market behaviour is immediately suspected. However, only two firms

control at least 70 per cent of the industry, with the three largest firms having a share of 95,8 per cent. That this is at least an oligopoly leaves no doubt, but a case might also be made out for this industry to be described as being duopolistic because of the economic power and behaviour of the two largest firms.

In Table 9.4.2 all the industries with between six and ten firms are indicated. To identify market structure beyond oligopoly from this table would border on random selection. (After examining the last two columns of the table,), however, one can assume with reasonable certainty, that all 21 industries listed in this table are oligopolistic in structure, that is, if a maximum of 10 firms per industry fall within a practical definition of oligopoly.

If the data in Tables 9.4.1. and 9.4.2. are considered simultaneously it appears that 42, or 23,3 per cent of all manufacturing industries, comprise ten or fewer firms. These industries have an average of 5,5 firms per industry and the average turnover of the three largest firms is 88,7 per cent. On average, 2,1 firms have a market share of at least 70 per cent. From these averages it is quite clear that economic power in these industries is concentrated in the hands of relatively few large firms. The above market structures are identified only in terms of the number of firms in an industry. Should the scope be widened to include practical considerations, many more instances of monopoly, duopoly and oligopoly may be identified. From the last section in Table 9.3.1, a case may then be made out for the existence of 53 oligopolistic industries, i.e. industries in which the three largest firms control at least 75 per cent of the turnover in their industries.

Table 9.4.2: Five-digit manufacturing industries with between 6 and 10 firms - 1972

Industry number	Title of category	Number of firms in industry	Percentage of total turnover of the 3 largest firms	Number of largest firms with at least 70% of the market
3110	Abattoirs: slaughtering, dressing and packing of livestock, including poultry and small game	7	89,1	3
31211	Vinegar	7	73,6	3
31221	Chaff cutting, compressed fodder and lucern meal milling	6	96,7	2
31222	Bone-meal and blood-meal	10	79,9	3
32110	Wool scouring and combing	10	74,3	3
32111	Cotton ginning	6	84,4	2
32114	Blankets	10	78,8	3
32190	Linoleum and coated fabrics	8	88,7	2
32311	Fellmongering	10	58,7	4
32330	Harness and saddlery	9	55,7	5
33119	Other mill products - cooperage wood-wool, etc.	8	61,7	4
33191	Coffins (excluding the manufacture of coffins by funeral undertakers)	6	97,5	2
35291	Inks	7	79,6	2
35400	Compounded and blended lubricating oils and greases	10	85,1	2
36920	Manufacture of cement	8	66,8	4
38250	Manufacture of office, computing and accounting machinery	6	94,4	2
38291	Tractors - agricultural and other	6	98,8	1
38393	Electric bulbs and fluorescent tubes	6	91,3	2
38540	Motor cycles, scooters, bicycles, tricycles and relevant specialized parts	10	96,0	1
38611	Orthopaedic appliances and supplies	10	59,8	4
38630	Manufacture of watches and clocks	6	99,0	1

Table 9.4.3 : Five-digit industries where 70%+ of total turnover is held by 3 (or fewer) firms

Industry	Title of category	Number of firms in industry	Percentage of total turnover held by 3 (or fewer) firms	Number of firms holdings at least 70% total turnover
31110	Abattoirs : slaughtering, dressing and packing of livestock, including poultry and small game	7	89,1	3
31112	Natural sausage casings; tallow, dripping and lard	4	92,0	2
31121	Condensed milk and milk powder and other edible milk products except icecream, ices, etc.	14	81,8	2
31131	Pickles and sauces	13	75,3	3
31132	Dried fruit packing	2	100,0	1
31150	Crude oil and oilseed cake and meal	5	98,5	2
31152	Whale oil	1	100,0	1
31161	Instant breakfast foods	5	90,2	2
31171	Macaroni, vermicilli and spaghetti	4	99,7	1
31210	Flavouring essences	5	95,8	2
31211	Vinegar	7	73,6	3
31213	Yeast	5	83,2	3
31221	Chaff cutting; compressed fodder and lucern meal milling	6	96,7	2
31222	Bone-meal and blood-meal	10	79,9	3
31330	Breweries, except Bantu beer breweries	3	100,0	1
31331	Breweries - Bantu beer	12	84,9	3
31400	Cigarettes, cigars, tobacco, snuff, etc.	15	98,4	2
32110	Wool scouring and combing	10	74,2	3
32111	Cotton ginning	6	84,4	2
32112	Fibre working (animal and vegetable)	2	100,0	1
32113	Dying, bleaching, printing and finishing	16	92,4	2
32114	Blankets	10	78,8	3
32150	Rope, cable, cordage, twine, net and related products	12	90,6	1
32190	Linoleum and coated fabrics	8	88,7	2
33112	Wattle bark grinding and compressing	5	92,3	1
33191	Coffins (excluding the manufacture of coffins by funeral undertakers)	6	97,5	2
34110	Pulp, paper, paperboard and fibreboard	13	94,3	3
35110	Tanning extract	3	100,0	2
35120	Fertilizers	15	90,6	2
35130	Manufacture of synthetic resins, plastic materials and man-made fibres, except glass	16	78,0	2
35230	Soap, other cleaning compounds and candles	58	80,5	2
35290	Polishes, waxes and dressings	17	79,6	2
35291	Inks	7	84,0	2
35292	Matches	2	100,0	1
35293	Explosives and ammunition	4	99,4	1
35300	Petrol, fuel oils, lubricating oils and greases from purchased materials other than crude petroleum	23 10	76,7 85,1	3 2
35510	Manufacture of tyres and tubes	5	85,8	3
36200	Sheet and plateglass, glass containers and other glassware not elsewhere classified	12	96,7	1
36201	Glass bevelling and silvering, safety glass and other glass products	23	78,1	2
36202	Scientific and laboratory glassware, except the grinding of optical lenses	4	98,7	1
36990	Plaster and other composite sheets, pipes etc. from gypsum, cement, asbestos, etc.	13	82,2	3
36993	Abrasives	14	73,6	3
37201	Precious metal refining on a fee contract basis	4	92,9	2
38190	Tinware	42	74,4	3
38210	Manufacturing of engine and turbines	3	100,0	1
38250	Manufacture of office, computing and accounting machinery	6	94,4	2
38291	Tractors - agricultural and other	6	98,8	1
38391	Dry cell batteries	4	97,7	1
38393	Electric bulbs and fluorescent tubes	6	91,3	2
38402	Radiators	18	81,8	2
38520	Locomotives, coaching and goods-stock	26	75,7	3
38540	Motorcycles, scooters, tricycles, bicycles, and relevant specialized parts	10	96,0	1
38550	Aircraft manufacture and repair	13	95,2	1
38612	Surgical, medical and dental supplies	17	82,4	2
38630	Manufacture of watches and clocks	6	99,0	1
39019	Other precious and semi-precious stone cutting and polishing	3	100,0	2
39092	Crayons, pens and pencils	5	81,2	3

Table 9.4.3 lists all industries where the three or fewer, largest firms share at least 70 per cent of the total turnover in that industry. All but five of the industries included in the previous two tables are included in this table.

Table 9.4.3 included 58 five-digit industries, or 32 per cent of all manufacturing industries representing 621 firms, or 4,9 per cent of all firms. The average turnover accounted for by the three largest firms is 87,7 per cent, while an average number of 1,9 firms control at least 70 per cent of their respective industries. It is unlikely that the three-firm average of 87,7 per cent would be equally distributed amongst the three largest firms. The empirical data collected showed, that in such a high three-firm concentration one firm usually has by far the greatest share of the market, while the other two members of the threesome each has a much less impressive share.

9.5 DISTRIBUTION OF FIRMS

Because of the large number of five-digit industries it is impracticable to analyse the distribution of firms, turnover, employment and fixed assets on an industry basis. They are therefore, analysed by means of frequency distribution tables. The components turnover, employment and fixed assets received attention in section 9.3, while number of firms is analysed in this section.

Table 9.5 reflects the distribution of the manufacturing firms amongst the 181 five-digit industries. The actual distribution ranges from an industry having only one firm (industry number 31152, Whale Oil) to the largest industry having 664 firms (number 34200, Printing and Publishing). The great majority of industries have less than 100 firms.

Table 9.5: Distribution of number of firms per five-digit manufacturing industry - 1972

Number of firms	Number of five-digit industries	Percentage of total number of industries	Number of firms	Percentage of total manufacturing firms
1 - 5	21	11,6	78	0,6
6 - 10	21	11,6	157	1,3
11 - 20	34	18,8	538	4,4
21 - 30	24	13,3	586	4,8
31 - 40	12	6,6	439	3,6
41 - 50	13	7,2	583	4,8
51 - 100	27	14,9	2070	17,1
101 - 200	13	7,2	1752	14,6
201 - 300	7	3,9	1723	14,3
301 - 400	2	1,0	681	5,6
401 +	7	3,9	3498	28,9
	181	100,0	12105	100,0

From Table 9.5 it is clear that 42 industries consist of 10 or fewer firms. This group, however, comprising 23,2 per cent of all the manufacturing industries represents only 235 firms, or 1,9 per cent of all manufacturing firms. At the other extreme there are 29 industries with more than 100 firms each. Comprising 16,0 per cent of all industries, this group includes no less than 63,2 per cent, or 7654, of all the manufacturing firms. Each of the seven largest industries according to number of firms, includes more than 400 firms. These seven industries have the largest single share as regards number of firms, namely 3498 firms, or 28,9 per cent of the total number of firms.

The conclusion can thus be drawn that a considerable disparity exists in the distribution of firms amongst the 181 manufacturing industries in that relatively few industries comprise more than sixty per cent of all firms.

9.6 CLASSIFICATION OF INDUSTRIES ACCORDING TO FOUR CATEGORIES OF CONCENTRATION

The same four categories, based on the three-firm share of turnover, which were used in the three-digit industry classification,[3)] can also be applied to the five-digit classification. The distribution of industries according to these categories is reflected in Table 9.6.1. The table includes the same classification for the five-firm concentration ratios. Since the five-digit industry classification is the most comprehensive classification availbale, the grouping of industries according to these categories provide the best indication of the extent of concentration in the South African manufacturing industry.

From Table 9.6.1. it can be seen that based on turnover, the three-firm concentration ratio indicates 58, or 32,0 per cent of the South African manufacturing industries as being highly concentrated. Judged on employment and fixed assets the table shows that 52 industries, or 28,7 per cent of all industries, and 78 industries, or 43,1 per cent of all industries, respectively, are highly concentrated. With such a large number of industries classified as highly concentrated, the South African manufacturing industry must be regarded as extremely highly concentrated.

Based on a five-firm concentration ratio the situation is even worse. In this case the percentage of industries classified as highly concentrated ranges from 47,0 per cent to 58,0 per cent for employment and fixed assets, respectively.

The identification of the industries actually involved in these concentration groups can be done from Appendix 5.

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3) See 8.5, page 222 of this study.

Table 9.6.1: Classification of five-digit manufacturing industries into four concentration categories, based on the three and five-firm concentration ratios on turnover

Category	Distribution of industries [4]											
	Turnover				Employment				Fixed assets			
	3-firm		5-firm		3-firm		5-firm		3-firm		5-firm	
	Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%	Number of industries	%
1. Highly concentrated industries (70% +)	58	32,0	94	51,9	52	28,7	85	47,0	78	43,1	105	58,0
2. Fairly concentrated industries (50%-69%)	47	26,0	42	23,2	46	25,4	31	17,1	40	22,1	37	20,5
3. Slightly concentrated industries (25%-49%)	50	27,6	31	17,2	52	28,7	49	27,1	49	27,1	33	18,2
4. Unconcentrated industries (less than 25%)	26	14,4	14	7,7	31	17,2	16	8,8	14	7,7	6	3,3
	181	100%	181	100%	181	100%	181	100%	181	100%	181	100%

4) See three- and five-firm concentration ratios in Appendix 5.

Based on a three-firm concentration ratio, at the most 31 industries, or 17,1 per cent of all industries, can be classified as being unconcentrated. On the basis of a five-firm ratio the comparative number is 14 industries, or 7,7 per cent of the total number of industries.

A study of these tables thus suffices to show that the South African manufacturing industry has a relatively high level of concentration of economic power.

9.7 IDENTIFYING THE 25 MOST CONCENTRATED FIVE-DIGIT INDUSTRIES.

Because of the large number of five-digit industries no attempt will be made to determine the rank in concentration in the same manner as was done in the previous two chapters. Instead, the 25 most concentrated five-digit industries are listed according to the criteria applied in the following paragraphs where only one variable namely, turnover, is employed. The following three criteria, based on information is Appendix 5, are applied to the turnover data in an attempt to determine rank in concentration:

Firstly, industries are ranked according to the number of firms that are responsible for at least 80 per cent of that industry's turnover. In accordance with this criterion many industries have the same rank. To distinguish between these similarly rated industries a second criterion is introduced. The second criterion comprises the firms having the same rating according to the first criterion and then separated according to the share of turnover controlled by the three largest firms in that industry. Where this measure failed to distinguish similarly concentrated industries, a third criterion has been introduced. The third criterion comprises the number of firms in an industry in an attempt to indicate the rank in concentration.

Table 9.7.1: The 25 most concentrated five-digit manufacturing industries, based on turnover - 1972.

Number of industry	Title of category	Number of largest firms with at least 80% of turnover	Turnover of the 3 largest firms in industry %	Number of firms in industry	Rank in concentration
31152	Whale oil	1	100,0	1	1
31132	Dried fruit packing	1	100,0	2	2
32113	Fibre working	1	100,0	2	2
35292	Matches	1	100,0	2	2
31171	Macaroni, vermicelli & spaghetti	1	99,7	4	5
35293	Explosives and ammunition	1	99,4	4	6
38630	Watches and clocks	1	99,0	6	7
38291	Tractors - agricultural & others	1	98,8	6	8
38391	Dry cell batteries	1	97,7	4	9
38540	Motorcycles, scooters, bicycles tricycles	1	96,0	10	10
38550	Aircraft manufacture & repair	1	95,2	13	11
33112	Wattle bark grinding & compressing	1	92,3	5	12
38210	Engines and turbines	2	100,0	3	13
31330	Breweries - except Bantu beer	2	100,0	3	13
35110	Tanning extract	2	100,0	3	13
39019	Semi-precious stone cutting and polishing	2	100,0	3	13
33191	Coffins	2	99,5	6	17
31400	Cigarettes, cigars, tobacco, snuff etc.	2	98,4	15	18
36202	Scientific and laboratory glassware	2	98,1	4	19
31221	Chaff cutting, compressed fodder	2	96,7	6	20
36200	Sheet and plate glass, containers, etc.	2	96,7	12	21
31210	Flavouring essences	2	95,8	5	22
32113	Dyeing, bleaching, printing etc	2	92,4	16	23
38393	Electric bulbs and fluorescent tubes	2	91,3	6	24
35120	Fertilizers	2	90,7	15	25

Table 9.7.2 The 25 most concentrated five-digit industries with a turnover of at least R5,0 million, in the South African manufacturing industry - 1972.

Number of industry	Title of category	Number of firms with at least 80% of turnover	Turnover of the 3 largest firms %	Number of firms in industry	Rank in concentration
31132	Dried fruit packaging	1	100,0	2	1
35292	Matches	1	100,0	2	1
35293	Explosives and ammunition	1	99,4	4	3
38291	Tractors - agricultural & others	1	98,8	6	4
38391	Dry cell batteries	1	97,7	4	5
38540	Motorcycles,scooters,bicycles	1	96,0	10	6
38550	Aircraft manufacture & repair	1	95,2	13	7
31330	Breweries-except Bantu beer	2	100,0	3	8
35110	Tanning extract	2	100,0	3	8
31400	Cigarettes,cigars,tobacco, snuff, etc.	2	98,4	15	10
36200	Sheet & plate glass,glass containers, etc.	2	96,7	12	11
31210	Flavouring essences	2	95,8	5	12
32113	Dyeing,bleaching,printing,etc.	2	92,4	16	13
38393	Electric bulbs and fluorescent tubes	2	91,3	6	14
35120	Fertilizers	2	90,7	15	15
32150	Rope,cable,cordage,twine,net	2	90,6	12	16
31150	Crude oil & oilseed,cake and meal	3	98,5	5	17
31161	Instant breakfast foods	3	90,2	5	18
31110	Abattoirs;slaughtering,dressing and packing	3	89,1	7	19
32190	Linoleum and coated fabrics	3	88,7	8	20
35510	Tyres and tubes	3	85,5	5	21
31331	Breweries - Bantu beer	3	84,9	12	22
32111	Cotton ginning	3	84,4	6	23
35291	Inks	3	84,0	7	24
31213	Yeast	3	83,2	5	25

Even after all three of these criteria had been applied to the five-digit concentration data, there were still some industries that retained the same rank. The final list of the 25 most concentrated industries, according to these criteria, appears, in Table 9.7.1.

Close examination of this table shows that a few small industries are included in the list. If the further qualification of a turnover of at least R5,0 million per annum is added, a more meaningful list of industries results, which appears in Table 9.7.2.

Several industries in which the conduct of firms often gives rise to debate are included in this table, for instance Explosives and Ammunition; Dry Cell Batteries; Breweries; Tobacco Products; the Fertilizer Industry and Glass and Glass Products. There is also an interesting similarity between data on the type and rank of industries in this table and similar data for other countries. This aspect will be discussed in Chapter 10.

9.8 COMPARING CONCENTRATION OF ECONOMIC POWER IN THE MANUFACTURING, WHOLESALE AND RETAIL AND CONSTRUCTION INDUSTRIES.

9.8.1 Orientation

A detailed analysis of the concentration of economic power of the wholesale and retail and construction industries in addition to the manufacturing industry would cover too broad a field for a single study of this nature However, since interesting deductions can be made and structural data compared, a bird's-eye view of concentration in those two industries is presented. In this section concentration of economic power is portrayed only

by means of the four concentration ratios based on turnover, the Lorenz curve and integration on the Lorenz curve.

9.8.2 Concentration of economic power in the wholesale and retail industry.

Data on wholesale and retail have been compiled from the Census of Wholesale and Retail Trade for 1970 -'71. Statistical data are not available for the whole industry as outlined by the SIC, but the sections covered are clearly identified. The four three-digit industries included are divided into 40 five-digit industries, representing 53623 firms.

Only one variable namely turnover, is used in compiling the relevant data. Turnover is defined as the total of:

cash sales; hire purchase; credit sales; charges for installation, repair, etc; charges for services rendered; commission received on purchases and sales; sundry trade income.

Appendix 6 includes the concentration ratios for this industry. By glancing through these ratios it becomes clear that there are at least six industries in which monopoly or near monopoly market structures and behaviour can be expected. They are shown in Table 9.8.2.1.

Table 9.8.2.1: Wholesale and Retail industries where five or fewer firms control at least 70 per cent of turnover.

Industry number	Title of Category	Number of firms in industry	Number of firms with at least 70% of turnover	Percentage of turnover of 3 largest firms
61001	Beverages	34	2	77,5
61007	Precious stones, jewellery and silverware	177	2	86,5
61300	Typewriters and other office equipment repairs	7	4	69,9
61301	Agricultural machinery and implements and farm tractor repairs	71	3	71,3
62016	General department stores	117	5	64,0
62102	Blacksmith shops	12	5	50,2

When an analysis of the distribution of economic power of the largest firm in each five-digit industry is made, as is shown in Table 9.8.2.2, it is found that in eight of these industries the largest firm controls at least 25 per cent of the turnover of that industry. It is also significant to note that in 22 industries the largest firm controls less than 10 per cent of turnover in each industry.

Table 9.8.2.2: Distribution of economic power of the largest wholesale or retail firm in each five-digit industry.

Percentage of industry turnover	Turnover	
	Number of Industries	Percentage of Industries
0 - 9	22	55,0
10 - 19	7	17,5
20 - 24	3	7,5
25 - 32	4	10,0
33 - 39	1	2,5
40 - 49	0	0
50 - 59	2	5,0
60 - 69	1	2,5
70 - 100	0	0
	40	100,0

Table 9.8.2.3 contains the share of turnover controlled by the cumulative number of wholesale and retail firms. From this measure of relative concentration the share of the 10 per cent largest firms, viz. 77,0 per cent, gives an indication of the inequality of size distribution of firms. This corresponds with the findings in the manufacturing industry. With 90 per cent of all firms in these industries having only a 23 per cent share in total turnover there is sufficient evidence to suspect market conduct not reconcilable with fair competition.

Table 9.8.2.3: Cumulative percentage of turnover controlled by the cumulative number of wholesale and retail firms

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover
2 679	5	68,48
5 360	10	77,00
8 041	15	81,78
10 722	20	85,16
13 404	25	87,76
16 085	30	89,85
18 766	35	91,58
21 447	40	93,07
24 128	45	94,39
26 809	50	95,49
29 490	55	96,42
32 172	60	97,26
34 853	65	97,97
37 534	70	98,55
40 215	75	99,02
42 896	80	99,41
45 577	85	99,69
48 259	90	99,87
50 940	95	99,97
53 623	100	100,00

The foregoing data have been compiled on a national basis with no geographical breakdown. It is therefore necessary to emphasise the importance of the geographical distribution of firms, especially in the case of the retail trade. It is quite possible that many more monopoly or near-monopoly situations may exist in practice than are suggested by the data. Especially in the rural areas, where the population does not justify more than one store, it often means that a single retailer has no, or very little competition in a relatively large geographical area.

9.8.3 Concentration of economic power in the construction industry

The data presented in this section have been compiled from the returns for the Census on Construction in 1971 - '72.

The construction industry is divided into two three-digit and seven five-digit industries, representing a total number of 7 845 firms.

Turnover was once again chosen as the only variable and was taken as the total of:

> all work invoiced out; charges for repairs and renovations; and sundry sales.

The basic concentration ratios for this industry are contained in Appendix 6. According to these ratios the construction industry does not seem to be too severely concentrated when firms are classified on a five-digit basis.

Table 9.8.3.1: Cumulative percentage of turnover controlled by the cumulative number of construction firms

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover
392	5	63,22
785	10	74,62
1 177	15	80,79
1 569	20	84,89
1 961	25	87,93
2 354	30	90,28
2 746	35	92,16
3 138	40	93,69
3 530	45	94,96
3 923	50	96,00
4 315	55	96,87
4 707	60	97,58
5 099	65	98,18
5 492	70	98,67
5 884	75	99,06
6 276	80	99,38
6 668	85	99,63
7 061	90	99,82
7 453	95	99,94
7 845	100	100,00

If the industry as a whole, a one-digit classification, is examined, Table 9.8.3.1 shows that 10 per cent of the firms are in control of 74,6 per cent of the total turnover. This gives an indication of the inequality of size distribution of all construction firms. Here, once again, the situation exists that relatively few firms control by far the largest share of the market.

9.8.4 A brief comparison of concentration in the manufacturing, wholesale and retail, and construction industries.

Comparison of the three one-digit industries in this section is done my means of the Lorenz curve, integration on the Lorenz curve and the concentration curve.

Graph 9.8.4.1 reflects the Lorenz curve for the various industries. From these graphs it is quite clear that all three industries are highly concentrated. Relative concentration for all three is in fact so closely related that the comparative level of concentration can only be distinguished by means of integration as is indicated in Table 9.8.4.1.

Table 9.8.4.1: Comparative concentration determined by means of integration on the Lorenz curve.

Manufacturing	Wholesale and retail trade	Construction
.83	.81	.80

This table shows that there is in fact negligible difference in relative concentration between these industries. Manufacturing is only slightly more concentrated than wholesale and retail and construction, respectively.

Table 9.8.4.2 gives an indication of the actual number of firms involved at each cumulative level of firms.

Graph. 9.8.4.1. THE LORENZ CURVE BASED ON TURNOVER. SELECTED INDUSTRIES IN THE SOUTH AFRICAN ECONOMY

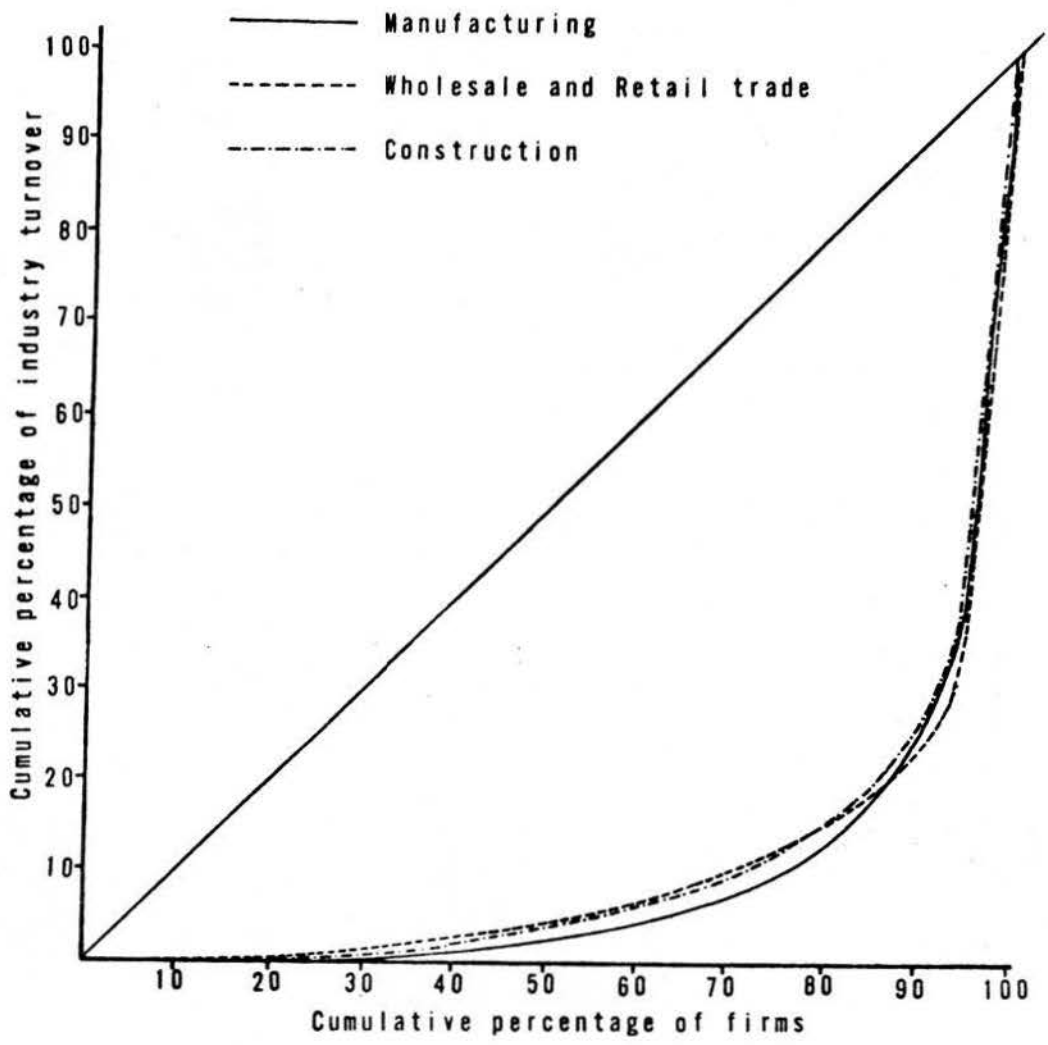


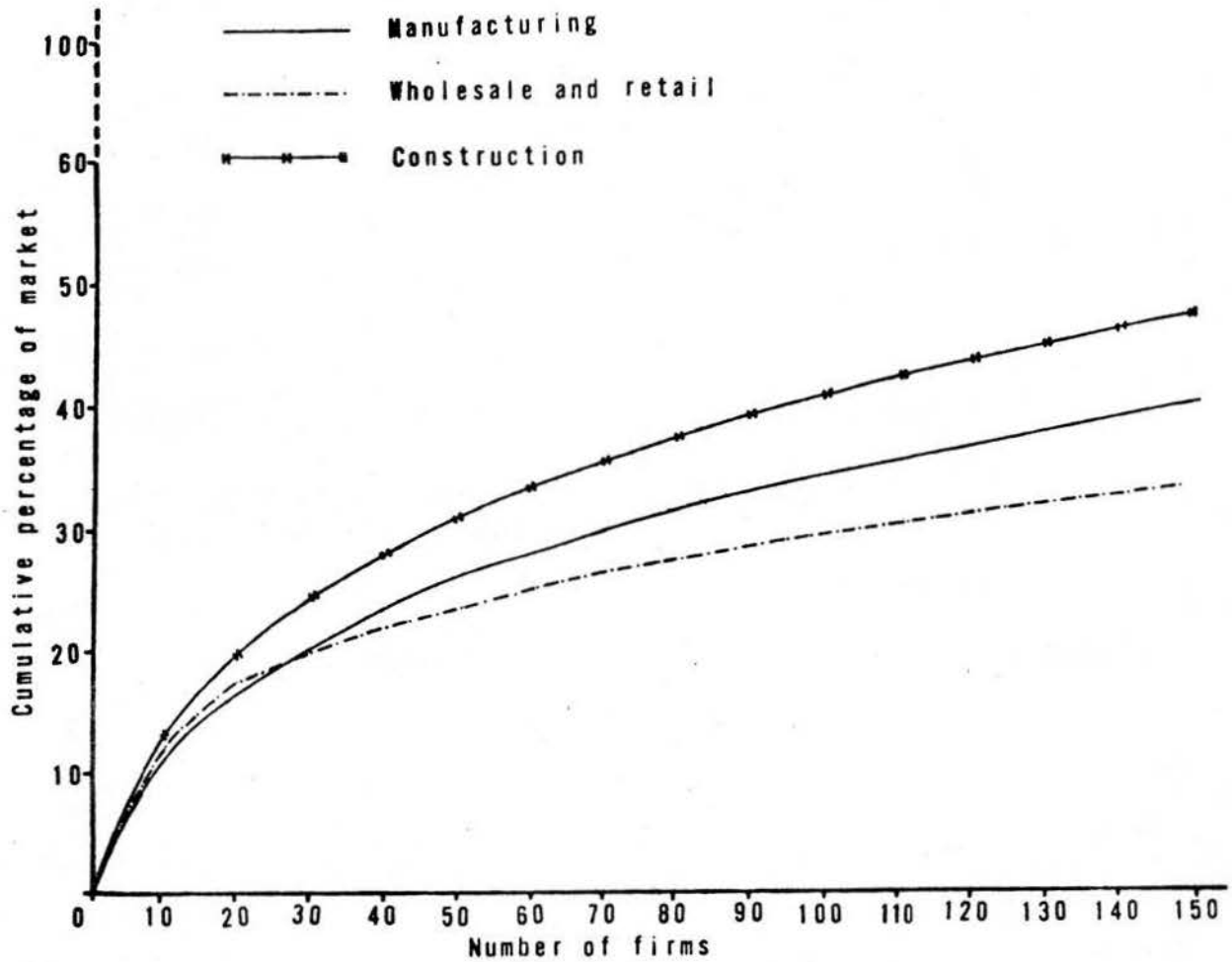
Table 9.8.4.2: Comparable market share of three one-digit industries based on turnover of the largest firms

Percentage of largest firms	Manufacturing		Wholesale and Retail		Construction	
	Number of firms	Percentage of turnover	Number of firms	Percentage of turnover	Number of firms	Percentage of turnover
10	1 210	75,7	5 360	77,0	785	74,6
25	3 026	90,3	13 404	87,8	1 961	87,9
50	6 053	97,5	26 809	95,5	3 923	96,0

Even though construction has the lowest concentration according to Table 9.8.4.1, it appears from Table 9.8.4.2 that it has the highest absolute concentration since only 785 firms control more than 70 per cent of the market as against 1 210 and 5 360 firms in the case of manufacturing and wholesale and retail, respectively.

Graph 9.8.4.2 gives a further indication of absolute concentration up to the 150-firm level. According to these curves the construction industry is the most concentrated. Since the other two curves intersect at the 30-firm level, it is difficult to say which is the most concentrated. However, wholesale and retail is more concentrated up to the 30-firm level and manufacturing beyond that point. The focal point for all three industries lies at the 10-firm level. This means that at least 10 firms in each industry controls more than their proportionate share of that industry while market share tends to become more evenly spread amongst the remainder.

Graph. 9.8.4.2. CONCENTRATION CURVES FOR THREE ONE-DIGIT INDUSTRIES IN THE SOUTH AFRICAN ECONOMY



9.9 SYNOPSIS

The analysis of economic concentration and of the structure of the manufacturing industry on a five-digit level is the most comprehensive portrayal of concentration. The firms included in each five-digit industry are directly comparable as far as product or service is concerned. This level of analysis is therefore most suitable when insight into the structure of an industry, or when data regarding the application of competition legislation are required. A micro analysis of structure and concentration is presented. One shortcoming of an analysis at this level is that conglomerate ownership of a single large enterprise is not revealed. Where a single concern has diversified into several branches of industry, sometimes even more than one firm in the same industry, each diversified firm will appear in its own right, without exposing their common ownership.

Several astonishing inferences regarding the inequality of firm sizes on a five-digit industry level were drawn from the data in this chapter. The following are a few of the outstanding inferences.

Firstly, more than 75 per cent of all manufacturing firms have a turnover of less than R0,5 million. This large number of firms, however, represents only 11,9 per cent of total manufacturing turnover.

Secondly, 71,6 per cent of all manufacturing firms has 50, or less, employees in their service. The great majority of firms, however, employs only 11,3 per cent of the entire manufacturing labour force. The 172, largest firms 1,4 per cent of all firms, in terms of employment, each employing more than 1 000 employees, have a combined employment of 35,1 per cent of the total manufacturing labour force.

Thirdly, 94,1 per cent of all manufacturing firms have fixed assets less than R0,5 million. This major group of firms,

however, controls only 14,9 per cent of total manufacturing fixed assets. At the other extreme, the 40 largest firms, 0,3 per cent of all firms, each with fixed assets in excess of R10,1 million, own no less than 44,9 per cent of total manufacturing fixed assets.

Fourthly, from the available data it clearly follows that the South African manufacturing industry is characterised by numerous examples of quasi monopolistic, duopolistic and oligopolistic market structures. Should a quantitative size limit, for the purpose of investigations under the Monopolies Act, be introduced, it would mean that many South African industries would immediately become liable for official investigation.

Fifthly, when all the five-digit industries are grouped according to four concentration categories which were developed in line with Australian and American examples, then more than 50 per cent of these industries must be considered as being either fairly or highly concentrated.

Sixthly, the table presenting the 25 most concentrated five-digit industries with an annual turnover of at least R5,0 million, includes many of the industries whose conduct often gives rise to debate.

Lastly, there seems to be little difference in relative concentration between the one-digit industries manufacturing, wholesale and retail and construction. They are all highly concentrated in the sense that relatively few firms control by far the largest share of total turnover. On a five-digit classification, according to the absolute measures, however, wholesale and retail and construction do not appear to be as highly concentrated as manufacturing.

CHAPTER 10

AN INTERNATIONAL COMPARISON OF ECONOMIC CONCENTRATION

10.1 INTRODUCTION

In this chapter an attempt will be made to compare the structure of several South African manufacturing industries with the structure of similar industries in other countries. "Comparative studies of this nature are of very recent origin and although there has been some upsurge in the amount of work done in the past few years, it nevertheless remains true that the information available at the present time is of a rather piece-meal and limited character."[1] Up to 1966 only a very few studies of this nature had been undertaken. Pioneers like Florence in 1953 and Bain in 1966[2] highlighted the problems encountered in attempting such comparisons. Until the publication of the findings of an inquiry into the economic structure in the EEC countries in 1969 most of these studies concentrated mainly on comparisons of economic structure in the United States of America and the United Kingdom. Since then, however, several other studies have also been undertaken.

The main problem in an analysis of this nature is to find comparable data for the relevant countries. The problems of a universally accepted measure of concentration, a generally accepted variable on which this measure is to be based and of using the same, or at least comparable classification of units or firms in the industries or economies are the main issues arising in comparisons of this nature. Up to now the common concentration ratios still prove to be the most popular measures for determining economic concentration.[3] The Standard Industrial Classi-

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1) George K.D. and Ward T.S., The Structure of Industry in the EEC, An International Comparison, Cambridge University Press, Cambridge, 1975, p. 1.

2) Ibid., p. 5.

3) See 5.2.6., page 139 of this study.

fication of all economic activities is enjoying increasing support as a basis for classification, an aspect which greatly facilitates comparative studies. The data on which a measure is to be based will probably remain a problem for some time to come since it depends entirely on the availability of relevant data for each individual economy. The indices employed in a comparative study are usually qualified with regard to the data used. It was already shown in the previous chapters that where the results based on the three variables turnover, employment and fixed assets are compared, the differences in the ranking of industries according to all three variables are negligible.

The problems pointed out above were also encountered in this study. A comparison with a few foreign countries is nevertheless attempted in the following sections.

10.2 SOUTH AFRICAN COMPARISON WITH THE UNITED STATES OF AMERICA, UNITED KINGDOM, WEST GERMANY, FRANCE AND ITALY

In this section certain selected manufacturing industries in South Africa are compared with more or less similar industries in the above-mentioned countries. The degree of concentration compared is that indicated by the four firm concentration ratio based on the variable employment. The ratios for the U.K., West Germany, France and Italy are based on studies of 1963 data and those for South Africa and the U.S.A. on 1972 data.[4)] The classification of industries is done according to the SIC, ranging from a two to a five-digit industry classification. Because the SIC is adapted for local conditions in each country where it is being used it happens in many of the tables that, for instance, a five-digit industry in South Africa is compared with a three-digit industry in another country.

4) Source references from part of the tables where the data are used.

In this regard the U.S.A., for instance, distinguishes many more industry classes which include firms that are even more homogeneous than in a four and five-digit classification in most other countries. It is, therefore, not possible to indicate concentration ratios for the U.S.A. in all those industries stipulated and the ratios that are indicated must be interpreted subject to this qualification.

In Table 10.2.1 the four firm concentration ratios for 34 industries are compared for five countries. By mere observation it is clear that concentration in the South African industries appears to be higher than those of the other countries. If the average concentration for these 34 industries for the first four countries in the table are compared it is clear that South Africa has a higher average concentration at 50 per cent than the U.K. at 36 per cent, West Germany at 20 per cent and France at 24 per cent. In an effort to make more meaningful deductions from this table the rank in concentration of 20 industries selected from this table are compared in Table 10.2.2. There is a remarkable agreement in the ranking of industries in all four countries. According to Kendall's coefficient of concordance of 0,7843 the agreement in the rankings are significant at a level of 0,005.

Where the South African ranking differs significantly from that of the other countries, the reasons can usually be attributed to the special features of the local market referred to in Chapter 6. For instance, the relatively small size of the local market and the optimum requirement for an economical plant size are important reasons for the high level of concentration in the South African beer market.

Table 10.2.1:

An international comparison of four firm concentration ratios based on employment, for three and five-digit industries - 1963 and 1972.

Industry group	R.S.A.* SIC number	R.S.A.	U.K.[5]	West Germany[5]	France[5]	U.S.A.[6] ***
Sugar	31180	43	95	41	42	59
Tobacco	31400	91	88	34	100	84
Watches & Clocks	38630	96	66	29	24	55
Aircraft	38550	97	65	59	57	66
Motor cycles	38540	98	65	25	43	65
Alcohol	31310	73	58	13	13	53
Office Machinery	38250**	88	54	53	67	-
Grain milling	31160**	27	51	10	10	33
Bread, biscuits	31170	19	48	4	15	29
Glass	362	85	48	21	39	55
Confectionery	31190**	56	47	25	15	32
General chemicals	352	31	44	38	35	-
Beer and malt	31330**	100	41	7	24	52
Domestic electric app.	38290**	73	40	28	25	-
Autos and parts	384	29	40	39	50	-
Soft drinks	31340	43	40	40	15	22
Games, toys	39090	68	38	18	11	35
Paper and board	34110	70	35	25	26	24
Rubber & asbestos	355**	59	35	34	50	62
Jewellery, etc.	39010	23	27	11	9	21
Textile finishing	321**	19	24	15	37	-
Scientific instruments	38610	47	21	17	22	22
Paper & Board products	341	29	17	12	5	-
Fur	32205	53	21	8	15	7
Footwear	32400	31	16	19	13	-
Hosiery	32130	22	16	10	7	35
Printing & publishing	34200	22	16	6	7	-
Wood Furniture	33200	14	15	4	3	14
Clay and pottery	36100	58	13	18	14	-
Leather & tanning	32310**	57	12	39	16	17
Leather products	323**	17	12	5	6	-
Plastic	35600**	13	11	10	6	-
Clothing	322	9	9	4	2	-
Timber	33110**	17	6	4	3	18
Average		50	36	20	24	-

* R.S.A. and U.S.A. ratio's based on 1972 data, others on 1963 data.

** Industries where the South African classification differs slightly from the others.

*** The U.S.A. employs a very sensitive classification which differs from the others in many instances.

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5) George, K.D. and Ward, T.S., op cit., p.46.

6) U.S. Bureau of the Census, Census of Manufacturers 1972, U.S. Government Printing Office, Washington, D.C. 1975.

Table 10.2.2:

Comparison of rank in 20 manufacturing industries in South Africa, the United Kingdom, West Germany and France

	Rank in concentration[7)]			
Industry	R.S.A.	U.K.	West Germany	France
Beer and malt	1	10	15	11
Motor cycles	2	3	8	6
Aircraft	3	3	1	3
Tobacco	4	2	6	1
Office machinery	5	6	2	2
Glass	6	7	10	8
Alcohol	7	5	13	14
Paper and Board	8	13	8	10
Rubber and Asbestos	9	13	6	4
Soft drinks	10	11	12	12
Sugar	10	1	3	7
General chemicals	12	9	5	9
Footwear	12	15	11	14
Autos and parts	14	11	4	4
Printing an publishing	15	16	16	19
Bread and biscuits	16	7	17	13
Timber	17	20	17	17
Wood furniture	18	17	17	17
Plastic	19	18	14	16
Clothing	20	19	17	20

7) Based on the four firm concentration ratios in Table 10.2.1., page 270 .

Table 10.2.3 also presents a comparison of economic concentration in twenty manufacturing industries. In this instance, however, the industries are classified on a two and three-digit basis according to the four firm concentration ratio based on employment. Based on the average concentration for these 20 industries South African manufacturing industries are again the most concentrated (31 per cent) with France second (26 per cent), Italy third (23 per cent) and West Germany fourth (21 per cent).

Table 10.2.4 is a comparison of the rank in concentration of these 20 industries listed in Table 10.2.3. There is an even higher correlation in the ranking of industries in this table than is the case in Table 10.2.2. Kendall's coefficient of concordance of 0,8246 is significant at a level of significance of 0,005. Of special significance is the high correlation in ranking of the first four industries. The conclusion can be drawn that there is a great similarity in the ranking of these industries according to the four firm concentration ratio, based on employment, for all the countries listed in these tables.

A type of comparison similar to the previous one is made in Table 10.2.5. In this table the ranking of twenty South African manufacturing industries is compared with the average rank of the same industries for a selected group of 12 foreign countries. The countries are Belgium, Canada, France, West Germany, Italy, Japan, Netherlands, Sweden, Switzerland, U.K., U.S.A. and Jugoslavia. The ranking of industries for the foreign countries was done according to four-firm concentration ratios for two-digit industries. The South African data are compiled from four-firm concentration ratios for three-digit industries. Here again there are many instances where the ranking of the South African industries are of a order similar to that of the 12 nation average.

Table 10.2.3:

International comparison of four firm concentration ratios for two and three-digit* industries based on employment 1963 and 1972[8)]

RSA SIC Number	Industry group	R.S.A.	West Germany	France	Italy
311	Food	11	12	20	18
313	Drink	39	10	17	19
314	Tobacco	91	34	100	78
321	Textiles	19	14	17	15
322	Footwear and Clothing**	9	7	5	3
331	Wood-working**	11	6	4	4
332	Wood-furniture	14	4	3	1
341	Paper and paper products	29	17	14	15
342	Printing & publishing	20	4	7	10
323	Leather & leather products	17	18	10	9
355	Rubber, asbestos, etc.	59	32	46	48
351	Chemicals**	40	30	24	35
353	Petroleum	83	50	66	41
369	Other non-metallic products	19	19	29	14
372	Metals**	37	35	37	41
381	Metal products	10	10	9	4
382	Mechanical engineering**	15	24	26	28
383	Electrical engineering	22	39	34	18
385	Transport equipment	58	33	38	46
390	Other manufacturers	9	23	20	19
	Average	31	21	26	23

* in the case of the R.S.A. a three-digit classification was used with 1972 data.

** industries where the South African classification differs slightly from the others.

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8) George, K.D. and Ward, T.S., op.cit., p. 22.

Table 10.2.4

Comparison in rank in concentration of 20 manufacturing industries in South Africa, West Germany France and Italy.

	Rank in concentration			
Industry	RSA	West Germany	France	Italy
Tobacco	1	4	1	1
Petroleum	2	1	2	4
Rubber, abestos, etc.	3	6	3	2
Transport equipment	4	5	4	3
Chemicals	5	7	9	6
Drink	6	15	12	8
Metals	7	3	5	4
Paper and paperproducts	8	12	14	12
Electrical engineering	9	2	6	10
Printing and publishing	10	19	17	15
Textiles	11	13	12	12
Other non-metallic products	11	10	7	14
Leather and leather products	13	11	15	16
Mechanical engineering	14	8	8	7
Wood-furniture	15	19	20	20
Wood-working	16	18	19	17
Food	16	14	10	10
Metal products	18	15	16	17
Other manufactuers	19	9	10	8
Footwear and clothing	19	17	18	19

Table 10.2.5:

Comparison of rank in concentration of 20 manufacturing industries in the R.S.A. and average rank for the same industries in twelve foreign countries

	Rank in concentration	
Industry	12 Nation average[9)]	R.S.A.
Tobacco Products	1	1
Transportation equipment	2	5
Machinery except electric and transport	3	14
Petroleum and coal products	4	6
Chemicals	5	7
Rubber products	6	4
Electrical equipment	7	10
Printing and publishing	8	11
Miscellaneous	9	18
Glass and glass products	10	2
Metal products except machinery	11	17
Primary metals	12	3
Food processing	13	19
Paper products	14	9
Beverages	15	8
Textiles	16	12
Leather products	17	13
Clothing and shoes	18	20
Lumber products except furniture	19	16
Furniture & fixtures	20	15

9) Pryor F.L. An International Comparison of Concentration Ratios, Review of Economics and Statistics, Vol. 54, 1972. p. 135.

10.3 A COMPARISON OF ECONOMIC CONCENTRATION IN SOUTH AFRICA AND AUSTRALIA

A comparison of economic concentration between South Africa and Australia is of interest because many features of the two economies are of a similar nature. Unfortunately more recent concentration data than that for 1962 could not be obtained for Australia.

The comparison of economic concentration is done in this instance by comparing the market structure of the manufacturing industries. Eight concentration categories, or market structures, are defined according to the number of firms in each five-digit industry that control at least 80 per cent of employment. In some instances gross output was used as a variable for the Australian industries.[10)]

If the cumulative percentage of the total number of industries is compared up to the second concentration class in Table 10.3, it appears that there are relatively more Australian industries with monopolistic and duopolistic market structures. On the other hand, 61.3% of all South African manufacturing industries is classified as being of an oligopolistic nature (i.e. classes three, four and five) compared with Australia's 47.1%. In the last three classes (six to eight), representing the unconcentrated industries, South Africa includes 24,9 per cent of her industries against the 28,9 per cent of Australia.

It thus seems that the South African manufacturing industry consists mainly of industries of an oligopolistic nature. On a relative basis there are fewer monopolistic and duopolistic industries, but there are also relatively fewer unconcentrated industries. No South African industries are classified as being highly competitive against the six found in Australia.

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10) Sheridan, K., op. cit., p. 41.

Table 10.3:

A comparison of the classification of manufacturing industries in Australia and South Africa-1962 and 1972.

Concentration category	Number of firms accounting for at least 80% of industry employment	No. of industries in each class		% of total number of industries In each class		Cummulative	
		Aus.	R.S.A.	Aus.	R.S.A.	Aus.	R.S.A.
. Monopolistic	One	13	8	12,5	4,4	12,5	4,4
. Duopolistic	Two	12	17	11,5	9,4	24,0	13,8
. High-oligopolistic	Three to five	24	35	23,1	19,3	47,1	33,1
. Moderate-oligopolistic	Six to ten	15	48	14,4	26,5	61,5	59,6
. Low-oligopolistic	11 to 21	10	28	9,6	15,5	71,1	75,1
. Unconcentrated	22 to 50	16	26	15,4	14,4	86,5	89,5
. Competitive	51 to 220	8	19	7,7	10,5	94,2	100,0
. Highly competitive	220 +	6	-	5,8	-	100,0	
	Total	104	181	100,0	100,0		

10.4 SYNOPSIS

Due to the lack of sufficient internationally comparable data a satisfactory comparison of concentration in various countries could not be undertaken. However, from the data available some interesting deductions can be made. They are briefly the following:

Firstly, there is a remarkable agreement in the ranking of industries according to concentration as indicated by the four-firm concentration data for all the countries analysed.

Secondly, based on the average concentration for the industries compared, concentration in the South African manufacturing industries seems to be higher than in the other countries included in the analysis.

Thirdly, as a consequence of some unique features of the South African economy to which the international SIC had to be adapted to suit local conditions, it was found that for the purpose of international comparison, South African three and five-digit industries have to be compared with two and three-digit industries for the developed nations of Western Europe and the U.S.A.

Fourthly, with regard to the Australian manufacturing industry there seems to be a smaller percentage of monopolistic and duopolistic industries in South Africa, but considerably more instances of oligopoly. A greater percentage of Australian industries fall in the category of unconcentrated industries than what is the case in South Africa.

CHAPTER 11

SUMMARY OF FINDINGS AND RECOMMENDATIONS

11.1 INTRODUCTION

The primary objective of this study was to furnish data on the concentration of economic power in the South African manufacturing industry on a comprehensive basis. In this regard several measures, based on the three main categories of concentration measures namely, absolute, summary and relative measures were employed to compile a comprehensive range of concentration indices.

In addition to the primary objective, several secondary objectives were defined which arose either directly from it or can be seen as an extension thereof. These were to analyse the structure of the manufacturing industry with regard to the distribution of the number of firms, turnover, employment and fixed assets; to outline briefly the means and practices whereby the concentration of economic power takes place as well as the merits and demerits of economic concentration; to explore the large variety of measures available for the determination of economic concentration and to compare their results; to analyse the influence of three different sets of data namely, turnover, employment and fixed assets on concentration indices and to determine whether they can be used interchangeably; to investigate the feasibility of introducing a factor quantifying the size of a firm for the purpose of the definition of a monopolistic condition in the South African competition legislation and, finally, to compare the concentration of economic power in South Africa with that of several other countries.

In the rest of this chapter the main findings and conclusions with regard to the above objectives are summarised. These findings and conclusions are arranged and discussed in the same order as that of the foregoing chapters.

11.2 SUMMARY OF THE MAIN FINDINGS AND CONCLUSIONS

In Chapter Two the concentration of economic power was shown to be a highly controversial subject. In this regard two main opposing points of view can be distinguished. Firstly, there is the view that concentration precludes effective market competition and therefore calls for the scrutiny and control of economic power possessed by large concerns. Secondly, there is the point of view which emphasises the advantages of corporate "bigness" and denies the equation of concentration of economic power with inefficiency, inflation, and any abuse of market power to the detriment of the public interest. This study confirmed the existence of a direct relationship between market imperfections and the concentration of economic power. The market structure of a specific industry, whether it is a monopoly, oligopoly or polypoly, is a direct result of the degree of concentration of economic power and is to an important extent the factor determining the degree of competition that can be expected in that industry. Since competition is an essential prerequisite for the survival of the capitalistically orientated system, there is justification for governmental involvement in order to guarantee the maintenance and enhancement of competition in its economy.

Concentration of economic power can be caused by either internal growth or combinations. Of these, combinations appear to be the main cause for the accumulation of economic power. Overseas the conglomerate combination was found to be the greatest cause of economic concentration since the 1950's.

The advantages and disadvantages of economic concentration give rise to much controversy. In the South African situation especially there are several industries in which such concentration can be in the public and national interest. Many of the advantages claimed for economic concentration, however, have already been disproved, or have been shown to exist only under special circumstances. There are also many disadvantages, especially the occurrence of restrictive trade practices which must always be taken account of.

It is the abuse, or potential to abuse economic power, which causes most dissatisfaction and which gives cause for government intervention.

Regarding competition legislation and economic concentration, there are basically two approaches that can be adopted by a government. Firstly, economic size can be controlled, per se, which means that the maximum size or market influence of a particular firm, or firms acting in collusion, in a particular industry will be subjected to legislation. Secondly, size may not be the subject for control, but rather the actual conduct of the firms possessing accumulated economic power. South African competition policy is based on this second approach. In Chapter Three the effect of the introduction of firm size into the definition of a monopolistic condition according to the South African Monopolies Act, was investigated. It was concluded that if the British definition of size, namely a 25 per cent share of the market controlled by one firm, or a group of firms acting in concert, is introduced in South Africa, at least 88 manufacturing firms, each representing a five-digit industry, will have to be classified as being monopolistic. If the West German criterion of $33\frac{1}{3}$ per cent is applied, at least 68 firms will be so classified. It would appear, therefore, that the introduction of such an aspect into South African legislation will have far reaching affects. The size criterion can, however, be used very effectively for the purpose of identifying those firms and industries where the potential for the abuse of economic power exists.

In Chapter Four the most frequently used measures and the methodology for determining economic concentration were examined. Four critical issues in this regard by which every analyst of economic concentration is confronted, were identified. They are briefly: The choice of a measure, or measures from the wide range available. These measures are divided into three groups namely, abstract measures,

summary measures and relative measures.

The second issue concerns the choice of a particular level in the industrial structure at which concentration is to be measured. In this regard there are several options of which either the establishment level or the firm level are usually used. The firm level is the most revealing and is used if the relevant data are available.

The third issue is the choice of the data on which the measures are to be based. Variables are classified mainly as being of a financial or non-financial nature. It very often happens that the analyst has a very limited choice, or no choice at all, in this regard and that he is forced to use the data that are available. Traditionally the body responsible for the taking of the official industrial census is the source for this kind of data as is indeed the case in most developed countries. With minor adaptations in the manner in which census data are being collected, and tabulated by the Department of Statistics in South Africa, the relevant data could also be produced on a regular basis for the South African economy.

The fourth issue concerns the classification of units, whether it be establishments or firms, into more or less homogeneous and comparable categories. In this regard there are several alternatives such as the classification of firms on a stock exchange, commodity classifications, classifications made by the Receiver of Revenue for income tax purposes and also the Standard Industrial Classification for all economic activities (SIC). Each one of these classifications has shortcomings. The SIC enjoys international recognition and is used where possible for the compilation of concentration data as was also the case in this study.

Chapter Five deals with the choice, for the purpose of this study, between the available alternatives mentioned in Chapter Four. Several measures from each of the three categories were selected to compile concentration indices for the South African manufacturing industry. It was also decided to measure concentration at the firm level instead of the establishment level because there are numerous examples where several establishments belong to the same firm. Compiling an index on an establishment basis would thus tend to understate concentration in the particular industries where this occurs. As for the third issue, both financial and non-financial variables were chosen namely, turnover, fixed assets and employment. This made possible the analysis and comparison of concentration in the same industry from various angles. The classification of firms was in accordance with the SIC. Four digital levels of industry classification namely, a one-digit, two-digit, three-digit and five-digit classification were used. The more digits in a classification the more homogeneous the firms grouped under the category.

Chapter Six serves as an introduction to the empirical analysis of economic concentration in the South African manufacturing industry. The main phases in the economic development of South Africa as well as some special characteristics of the economy were stressed as background to the empirical analysis. The geographical isolation and the size of the local market were found to be two important features having an effect on economic concentration in South Africa.

Chapter Seven presents an analysis of the structure and economic concentration of the manufacturing industry on the basis of a two-digit industry classification. The two-digit classification is a very broad classification which groups together all those firms which are related in terms of either the nature of the production process, raw materials

or semi-processed materials used or the use of the final products. All nine measures of concentration employed in this chapter indicated that the South African economy is highly concentrated on a two-digit industry level. Of the nine two-digit industries distinguished, number 37, the Basic Metal Industry is the most concentrated. Industry number 36, Non-metallic Mineral Products, is the second most concentrated and industry number 35, Chemicals and Chemical, Petroleum, Coal, Rubber and Plastic Products, is the third most concentrated. The largest two-digit manufacturing industry, based on the average rank according to the number of firms, turnover, employment and fixed assets, industry number 38, Fabricated Metal Products, Machinery and Equipment, is except for one industry, the least concentrated two-digit industry. Its level of concentration, however, is still high since only 2,5 per cent of the firms control 89,7 per cent of turnover, 85,0 per cent of employment and 92,4 per cent of fixed assets in the industry.

The same type of analysis was done in Chapter Eight, but on the basis of a three-digit industry classification. According to the structural analysis the Food Industry, number 311, is the largest three-digit manufacturing industry. It is the nineteenth most concentrated of all 30 manufacturing industries. The Tobacco Industry, number 314, was indicated by all three types of concentration measures as being the most concentrated. The four largest industries, according to the structural analysis, are not amongst the 14 most concentrated manufacturing industries. According to the three firm concentration ratio based on turnover, the six most concentrated industries include only 3,4 per cent of all manufacturing firms, but control 16,2 per cent of all manufacturing turnover, 10,7 per cent of employment and 29,6 per cent of fixed assets. All the measures of economic concentration employed in this chapter pointed to a relatively high level of economic concentration in the South African manufacturing industry.

Chapter Nine presents a structural analysis and an analysis of economic concentration in the South African manufacturing industry, on a five-digit industry basis. This is the most comprehensive classification of industries, grouping together firms that are engaged in similar fields of manufacturing. The indices based on the concentration ratio and the Horvath comprehensive measure of concentration for the 181 five-digit industries found in Appendix 5, form an integral part of this study. Table 9.2.1, contains a list of the 20 most concentrated industries according to the Horvath index and includes several important industries such as, aircraft manufacture and repair, explosives and ammunition, dry cell batteries, glass, electric bulbs and fluorescent tubes, precious metal refining and fertilizers. An analysis of the size distribution of the 12105 manufacturing firms emphasises some interesting features. More than 75 per cent of these firms have an annual turnover of less than RO,5 million and represents only 11,9 per cent of total manufacturing turnover. On the other hand the 14 largest firms, representing only 0,11 per cent of all firms, have a greater share of total turnover namely, 12,8 per cent. In terms of fixed assets the inequality of size distribution of firms is even worse. Only 14,9 per cent of total investment in fixed assets is distributed amongst 94,0 per cent of all the manufacturing firms having an individual investment in fixed assets of less than RO,5 million. This inequality of size distribution is further stressed by the data in Table 9.4.3 which shows that in 58 five-digit industries, 32 per cent of all industries, the three largest firms in each industry control at least 70 per cent of turnover. In this chapter a comparison of concentration in wholesale and retail, construction and manufacturing is included and showed a very high level of relative concentration in all three industries.

In Chapter 10 economic concentration in South Africa is compared with that in several other countries. Despite the problem of finding comparable concentration data for the different countries it was possible to make two interesting deductions from the available data. Based on the average

concentration for the industries compared, concentration in South Africa seems to be at a higher level than in the U.K., West Germany, France and Italy. Another feature is the high correlation in the ranking of industries from highest to lowest concentrated. Basically the same industries in all the countries ranked as having the highest concentration in each country, which implies that these industries must have certain inherent qualities and characteristics which tend to make them more highly concentrated. Compared to Australia, a smaller share of the South African manufacturing industry is monopolistic. However, a smaller share is also classified as being highly competitive, the majority of industries being oligopolistic.

Another finding which merits special mentioning is based on the comparison of the results obtained by means of the different measures used in Chapters Seven and Eight to determine the extent of economic concentration, as well as the comparison of the concentration indices according to the three variables turnover, employment and fixed assets. As regards the comparison of the measures of concentration, a significant correlation was found in the ranking of industries according to the absolute, summary and relative measures. This finding is an endorsement of the findings of many other analysts, of whom five were quoted in Chapter Five. A similar conclusion was also drawn from the comparison of the indices according to the three sets of data on which the measures were based. The indices are so significantly the same that similar inferences can be drawn from the indices based on any one of the three. This implies that similar inferences can be drawn from the results of different measures, based on any one of the three sets of concentration data.

11.3 RELEVANCE OF FINDINGS AND RECOMMENDATIONS

For the first time quantitative proof of the degree of concentration of economic power in South Africa is provided. From the data furnished in the six appendices, as well as the analysis in the relevant chapters, it stands out clearly that the manufacturing industry in South Africa is highly concentrated. This study did not concentrate on competition legislation as such, but any legislation of this nature is greatly dependent on quantitative data on the structure of the economy. It is therefore trusted that the concentration data provided in this study in addition to that already collected for the Mouton Commission, will be useful to those responsible for the formulation and implementation of competition policy in South Africa.

Another feature of the concentration data in this study is that it is provided on the firm level according to the SIC of industries, instead of on an establishment level, according to other, less acceptable, manners of classification. This means that two of the main shortcomings of concentration indices had been overcome as far as concentration data for the South African manufacturing industry are concerned. Against the background of this data it should now be possible to conduct numerous related studies such as for example a comparison of concentration at the establishment level with concentration at the firm level; the comparison of profitability and productivity with economic concentration in specific industries; determination of the trend in economic concentration in South Africa; the occurrence of restrictive trade practices with regard to the economic concentration in the relevant industries; and many others.

The fact that it was possible to present concentration indices based on three sets of data in the same industry namely, turnover, employment and fixed assets is unique in the sense that only one set of data is normally available for this type of analysis. The similarity found in the indices according to the three sets of data, implying the interchangability thereof, is especially meaningful in the

South African context where concentration data is difficult to obtain. This difficulty in South Africa is to a large extent unnecessary. The Department of Statistics normally collects all the relevant data in the biennial Census of Manufacturing, as well as in the censuses for the other sectors of the economy. These data are then published in terms of the establishments covered by the census. By adapting and publishing this data in terms of the firms involved would regularly provide very useful and informative concentration data which has wide applicability.

Together with this recommendation it is also recommended that the Department of Statistics interpretation of the secrecy clause on the Statistics Act, 1976 be amended. In an effort to protect the identity and relevant statistical data for any individual firm, no data for less than three firms may be furnished. The reason for this protection of the identity of individual firms is not clear. In the U.S.A., the U.K. and all the countries of Western Europe concentration data are published along with the names of the relevant firms.

A final recommendation, based on the findings in Chapter Three, is that the definition of a monopolistic condition in the Monopolies Act be amended to include an indication of firm size in terms of turnover. This would lead to many firms being identified as being monopolistic according to the criteria for market structure. Their conduct can then serve as the final criterion in determining whether such firms are in fact responsible for the existence of an undesirable monopolistic condition or not.

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APPENDIX 1

CONCENTRATION INDICES FOR TWO-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

This Appendix contains the indices for four variants of the common concentration ratio, each based on three variables.

Measures:	Variables
CR_{10}	Turnover
CR_{50}	Employment
$CR_{70\%}$	Fixed assets
$CR_{80\%}$	

CONCENTRATION INDICES FOR TWO-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

Industry No.	Title of category	Number of firms	TURNOVER: Turnover of the x largest firms		TURNOVER: Number of largest firms with at least y% of total turnover		EMPLOYMENT: Employment of the x largest firms		EMPLOYMENT: Number of largest firms with at least y% of total employment		FIXED ASSETS: Fixed assets employed by the x largest firms		FIXED ASSETS: Number of largest firms employing at least y% of fixed assets	
			x=10	x=50	y=70%	y=80%	x=10	x=50	y=70%	y=80%	x=10	x=50	y=70%	y=80%
31	Manufacture of Food, Beverages and Tobacco	1603	.2812	.5321	117	199	.1539	.3961	191	305	.2568	.5627	99	170
32	Textile, wearing apparel and Leather Industries	2034	.1641	.3731	221	336	.1464	.3470	260	399	.2320	.5621	91	150
33	Manufacture of Wood and Wood Products, including Furniture	1175	.2125	.4351	169	258	.1517	.3640	202	294	.3552	.6155	82	142
34	Manufacture of Paper and Paper Products, Printing and Publishing	981	.3435	.6625	61	112	.2768	.5904	86	159	.5679	.8180	25	44
35	Manufacture of Chemicals and of Chemical, Petroleum, Coal, Rubber and Plastic Products	839	.4123	.6857	55	104	.2984	.5678	101	165	.6265	.8601	16	30
36	Manufacture of Non-metallic Mineral Products	742	.3831	.7391	42	70	.3147	.5791	98	171	.5994	.8632	19	33
37	Basic Metal Industries	222	.6362	.8959	15	28	.6274	.8687	17	31	.8676	.9739	3	6
38	Manufacture of Fabricated Metal Products, Machinery and Equipment	3946	.2076	.4126	269	496	.1346	.3263	427	737	.2415	.4862	170	322
39	Other Manufacturing Industries	563	.2585	.5891	77	113	.2003	.5142	110	165	.3014	.6410	68	116

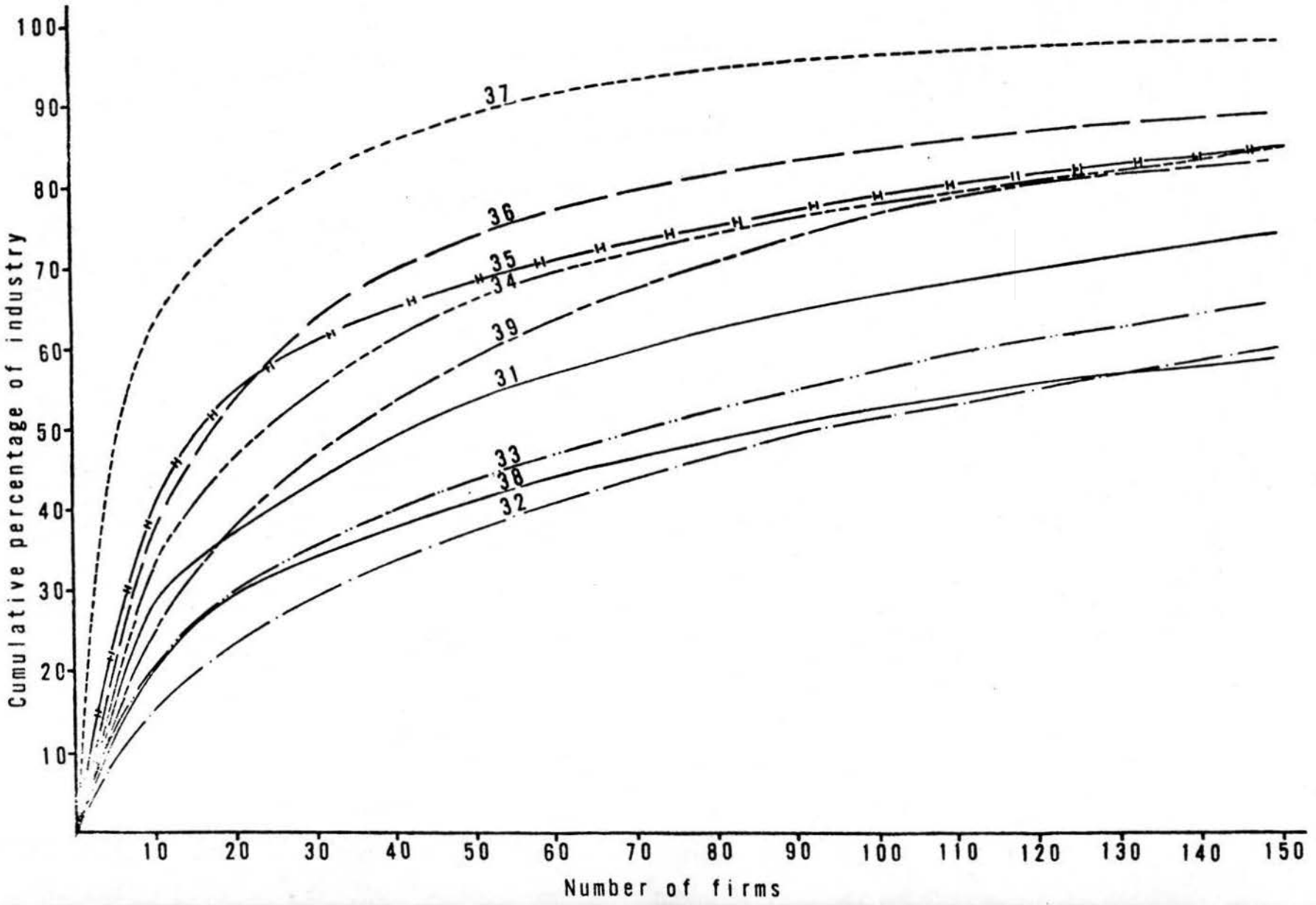
APPENDIX 2

THE CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN TWO-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

Page one of this appendix contains the concentration curves, based on turnover, for the nine two-digit industries. The quantitative data and the Lorenz curves based on this data are portrayed for each of the nine two-digit manufacturing industries. The cumulative number and percentage of firms and their cumulative share of each of the three variables are portrayed.

Firms are arranged from large to small in the tables containing the concentration data, while the firms in the cumulative percentage of firms indicated on the horisontal axis of the Lorenz curves are arranged from small to large.

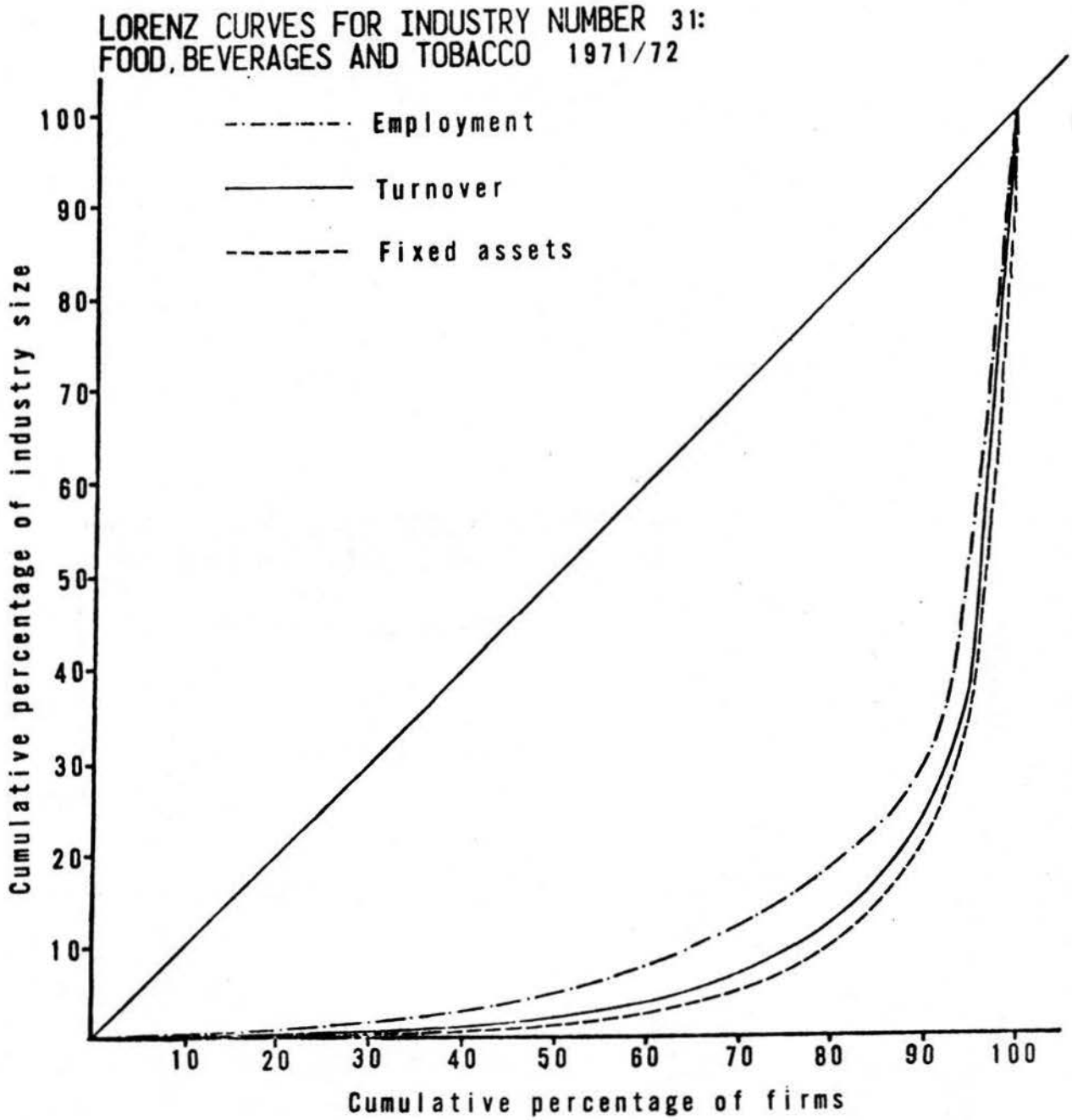
CONCENTRATION_CURVES BASED ON TURNOVER, FOR TWO-DIGIT MANUFACTURING INDUSTRIES 1971/72
INDUSTRIES NUMBER 31 TO 39:



CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

31. MANUFACTURE OF FOOD, BEVERAGES AND TOBACCO

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
81	5	63,0	50,3	66,0
161	10	76,1	72,2	79,0
241	15	83,6	80,0	86,0
321	20	88,1	81,1	90,4
401	25	91,1	85,1	93,1
481	30	93,2	88,2	94,9
561	35	94,9	90,5	96,2
642	40	96,1	92,4	97,2
722	45	97,1	93,9	97,8
802	50	97,8	95,2	98,4
882	55	98,4	96,2	98,8
962	60	98,8	97,4	99,1
1 042	65	99,2	97,7	99,4
1 123	70	99,5	98,3	99,6
1 203	75	99,7	98,8	99,7
1 283	80	99,8	99,2	99,8
1 363	85	99,9	99,5	99,9
1 443	90	99,9	99,7	99,9
1 523	95	99,9	99,9	99,9
1 603	100	100,0	100,0	100,0

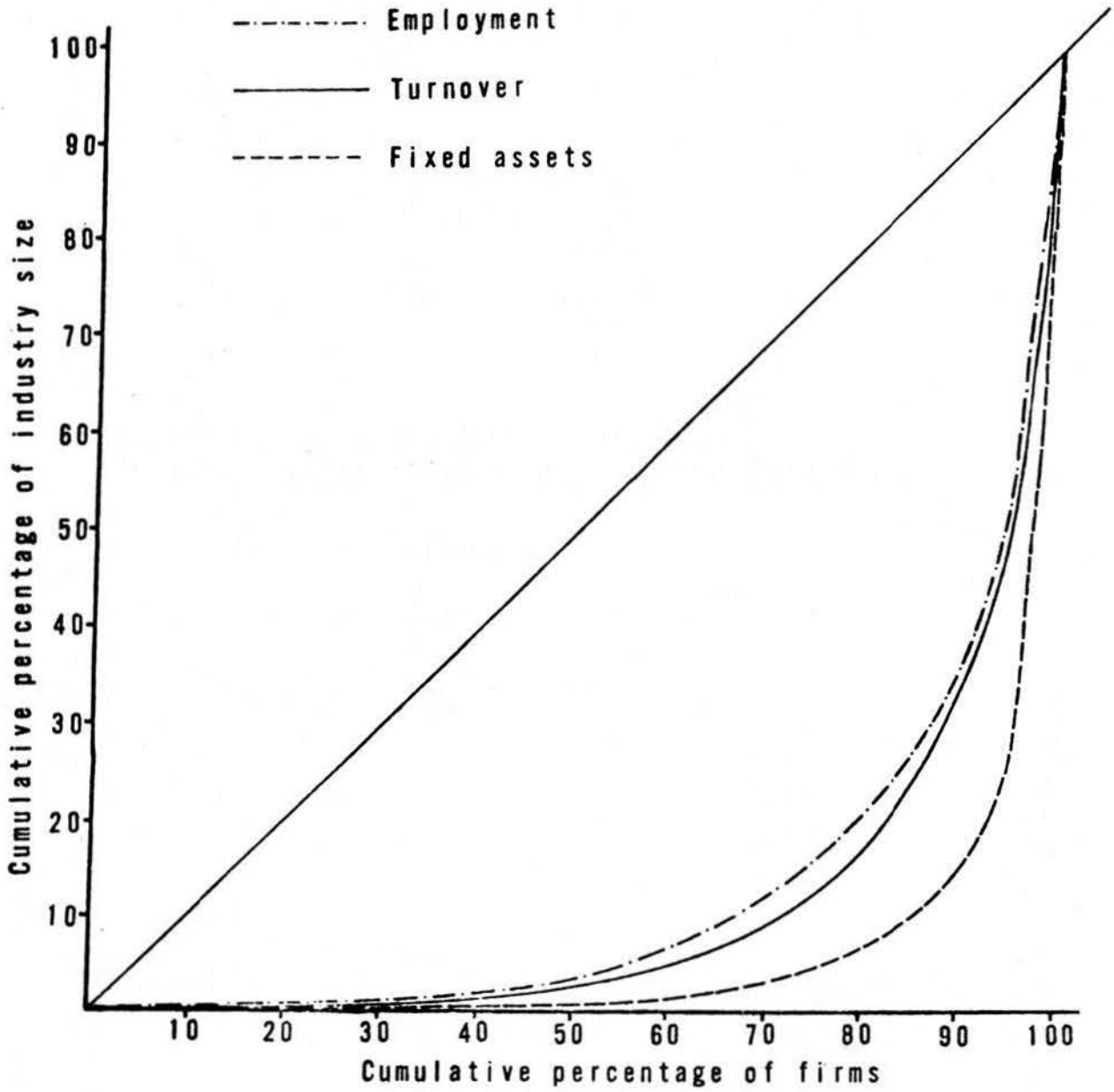


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

32. TEXTILE, WEAVING APPAREL AND LEATHER INDUSTRIES

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
102	5	50,8	47,8	71,8
203	10	67,1	63,4	84,7
305	15	76,8	72,9	90,1
407	20	83,4	79,6	93,1
509	25	88,1	84,5	95,1
610	30	91,4	88,3	96,4
712	35	93,8	91,2	97,4
814	40	95,7	93,4	98,1
915	45	96,9	95,2	98,7
1 017	50	97,8	96,6	99,0
1 119	55	98,4	97,6	99,3
1 220	60	98,9	98,3	99,5
1 322	65	99,2	98,8	99,7
1 424	70	99,5	99,2	99,8
1 526	75	99,7	99,4	99,8
1 627	80	99,8	99,6	99,9
1 729	85	99,9	99,8	99,9
1 831	90	99,9	99,9	99,9
1 932	95	99,9	99,9	99,9
2 034	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 32:
TEXTILE, WEARING APPAREL AND LEATHER INDUSTRIES 1971/72

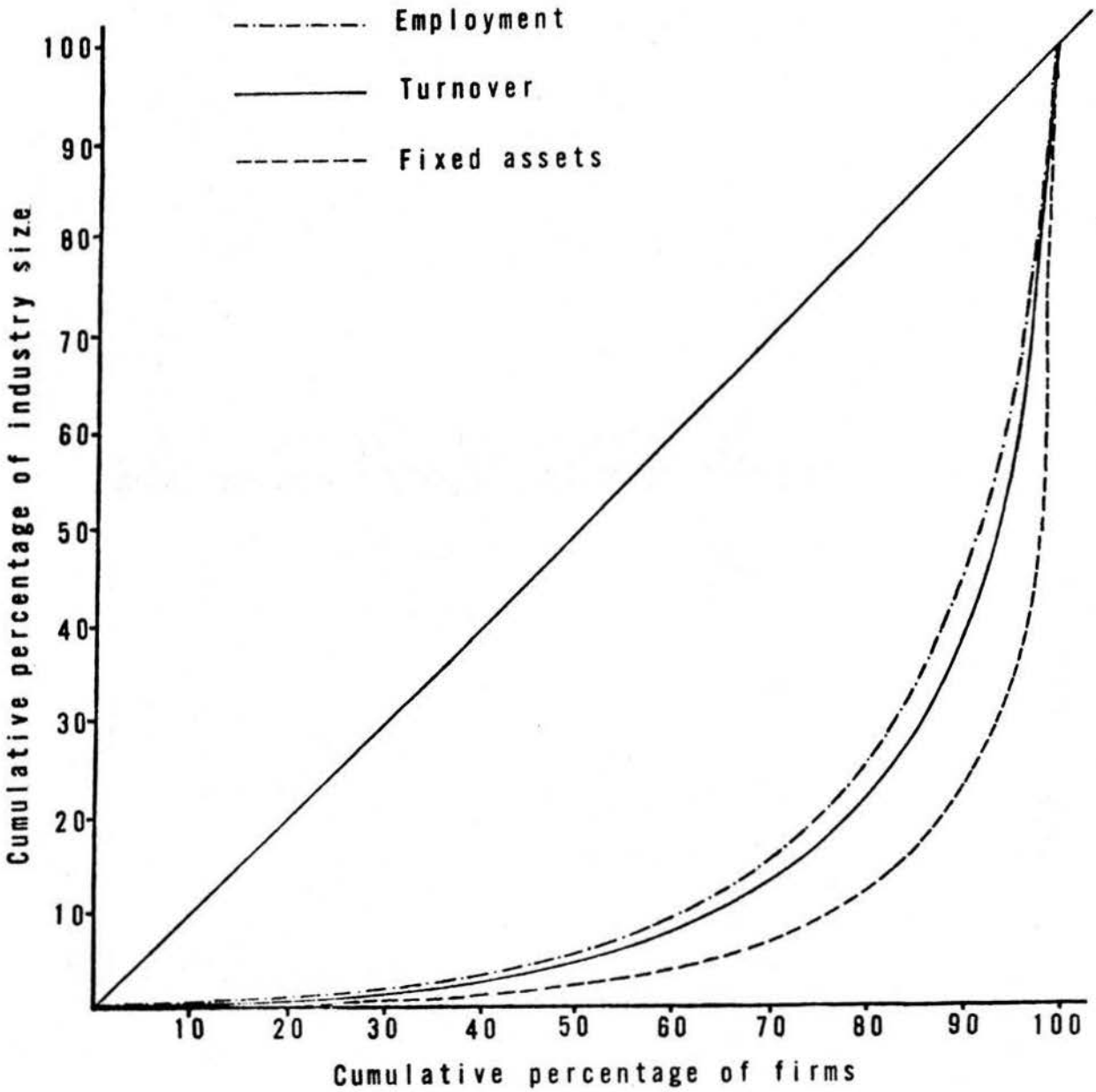


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

33. MANUFACTURE OF WOOD AND WOOD PRODUCTS INCLUDING FURNITURE

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
59	5	46,6	39,5	64,3
118	10	61,4	55,7	76,6
177	15	71,1	66,6	83,6
235	20	77,8	74,1	87,7
294	25	83,0	80,0	90,6
353	30	86,8	84,6	92,8
412	35	89,8	88,0	94,5
470	40	92,0	90,5	95,8
529	45	93,8	92,6	96,7
588	50	95,3	94,1	97,5
647	55	96,4	95,4	98,1
705	60	97,3	96,4	98,6
764	65	98,0	97,3	99,0
823	70	98,6	98,0	99,3
882	75	99,1	98,6	99,5
940	80	99,4	99,0	99,7
999	85	99,7	99,4	99,8
1 058	90	99,8	99,7	99,9
1 117	95	99,9	99,9	99,9
1 175	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 33:
WOOD AND WOOD PRODUCTS, INCLUDING FURNITURE 1971/72

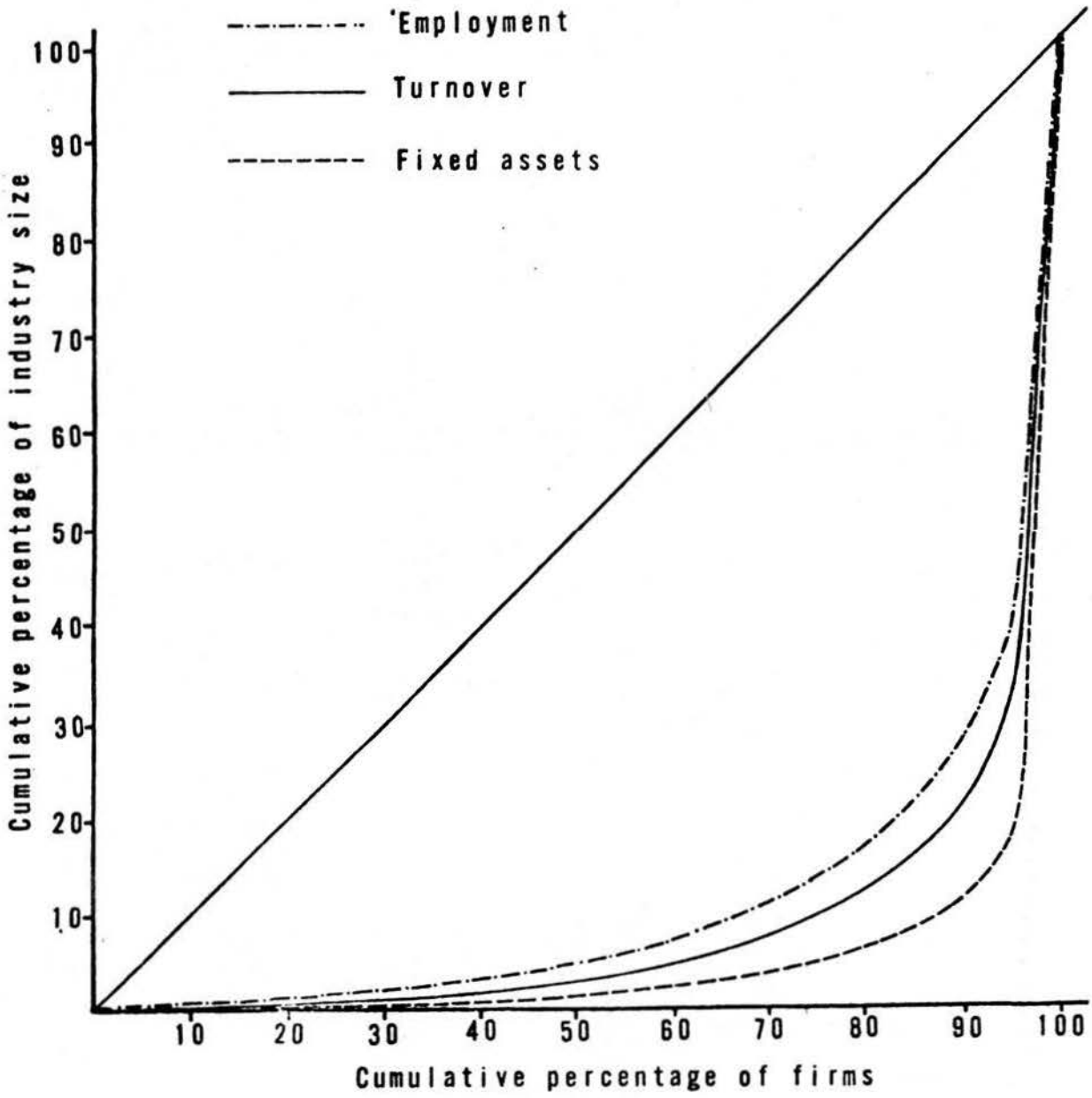


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

34. MANUFACTURE OF PAPER AND PAPER PRODUCTS, PRINTING AND PUBLISHING

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
50	5	66,3	59,0	81,8
99	10	78,3	72,5	88,8
148	15	84,0	78,9	91,8
197	20	87,6	83,2	93,7
246	25	90,3	86,5	95,2
295	30	92,3	89,0	96,2
344	35	93,9	91,0	97,0
393	40	95,1	92,6	97,7
442	45	96,1	94,0	98,2
491	50	96,9	95,0	98,6
540	55	97,6	96,1	99,0
589	60	98,2	96,9	99,2
638	65	98,7	97,6	99,6
687	70	99,1	98,2	99,8
736	75	99,4	98,8	99,9
785	80	99,6	99,2	99,9
834	85	99,8	99,5	99,9
883	90	99,9	99,8	99,9
932	95	99,9	99,9	99,9
981	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 34:
PAPER AND PAPER PRODUCTS, PRINTING AND PUBLISHING 1971/72

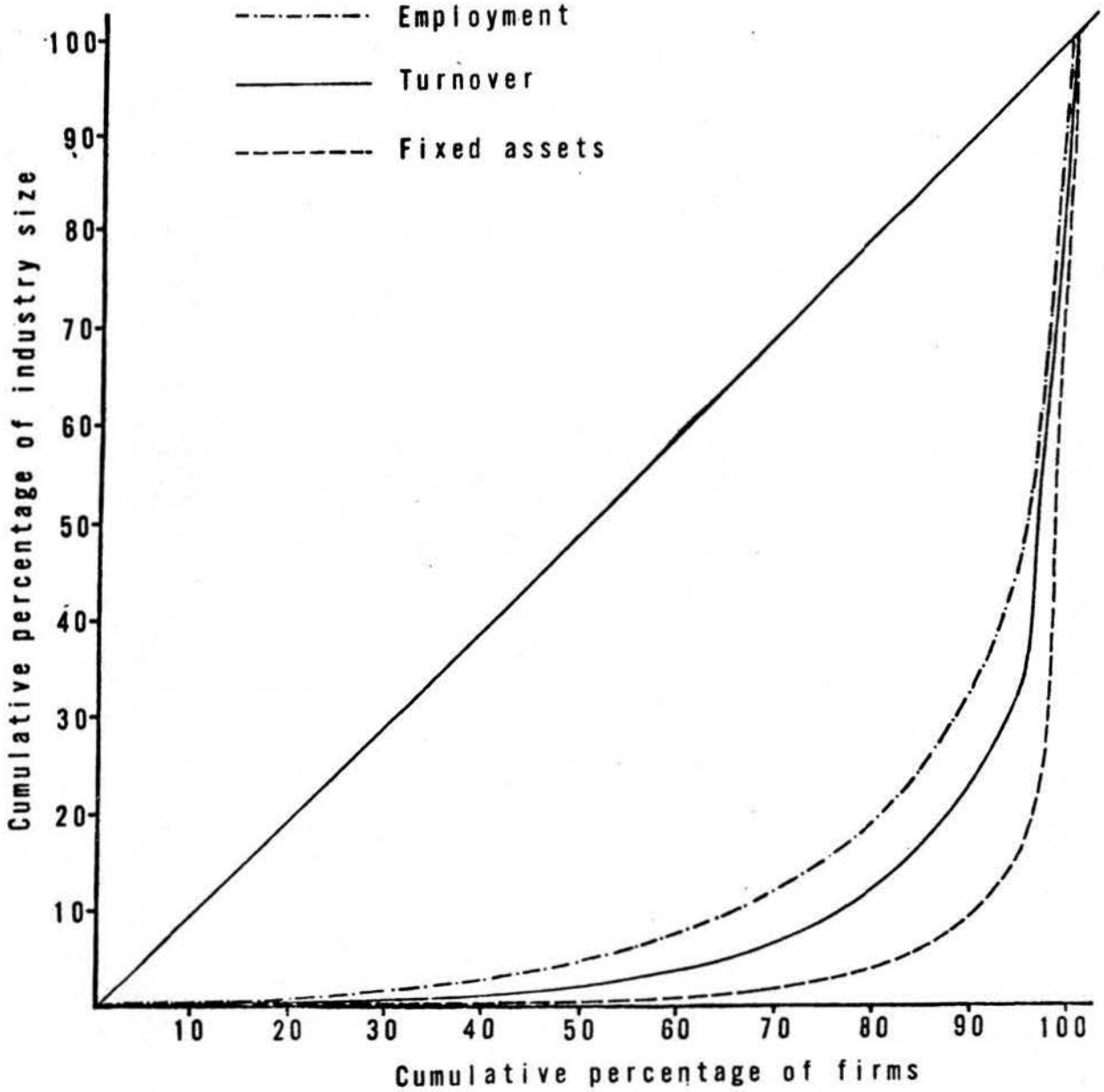


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

35. MANUFACTURE OF CHEMICALS AND OF CHEMICAL, PETROLEUM, COAL, RUBBER AND PLASTIC PRODUCTS

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
42	5	66,0	53,8	84,2
84	10	76,6	66,4	90,4
126	15	83,2	74,5	93,4
168	20	87,6	80,4	95,5
210	25	90,8	84,6	96,8
252	30	93,1	87,7	97,7
294	35	94,7	90,3	98,3
336	40	95,8	92,2	98,8
378	45	96,8	93,7	99,1
420	50	97,5	95,0	99,3
462	55	98,1	96,0	99,5
504	60	98,6	96,9	99,7
546	65	99,0	97,7	99,8
588	70	99,3	98,3	99,8
630	75	99,5	98,8	99,9
672	80	99,7	99,2	99,9
714	85	99,8	99,5	99,9
756	90	99,9	99,8	99,9
798	95	99,9	99,9	99,9
839	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 35: CHEMICALS AND CHEMICAL, PETROLEUM, COAL, RUBBER AND PLASTIC PRODUCTS 1971/72

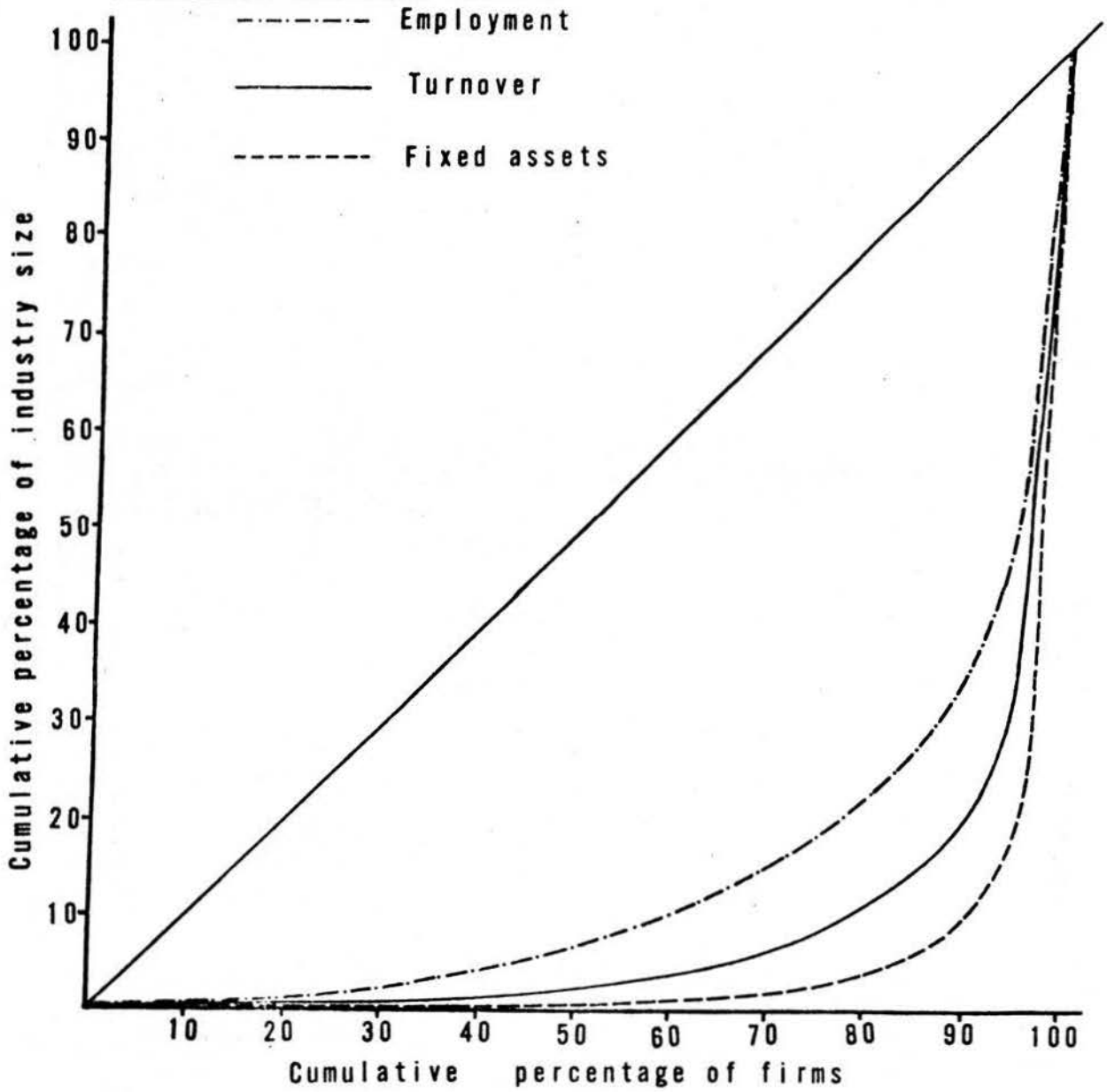


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

36. MANUFACTURE OF NON-METALLIC MINERAL PRODUCTS, EXCEPT PRODUCTS OF PETROLEUM AND COAL

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
38	5	68,2	53,1	82,5
75	10	81,3	65,1	90,8
112	15	86,7	72,5	94,0
149	20	89,9	77,7	95,7
186	25	92,3	81,6	96,8
223	30	94,0	84,7	97,6
260	35	95,4	87,3	98,1
297	40	96,4	89,6	98,5
334	45	97,1	91,5	98,8
371	50	97,8	93,1	99,1
409	55	98,3	94,6	99,3
446	60	98,8	95,7	99,5
483	65	99,1	96,7	99,6
520	70	99,4	97,6	99,8
557	75	99,6	98,3	99,8
594	80	99,8	98,9	99,9
631	85	99,9	99,3	99,9
668	90	99,9	99,7	99,9
705	95	99,9	99,9	99,9
742	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 36:
NON-METALLIC MINERAL PRODUCTS, EXCEPT PRODUCTS OF PETROLEUM AND COAL 1971/72

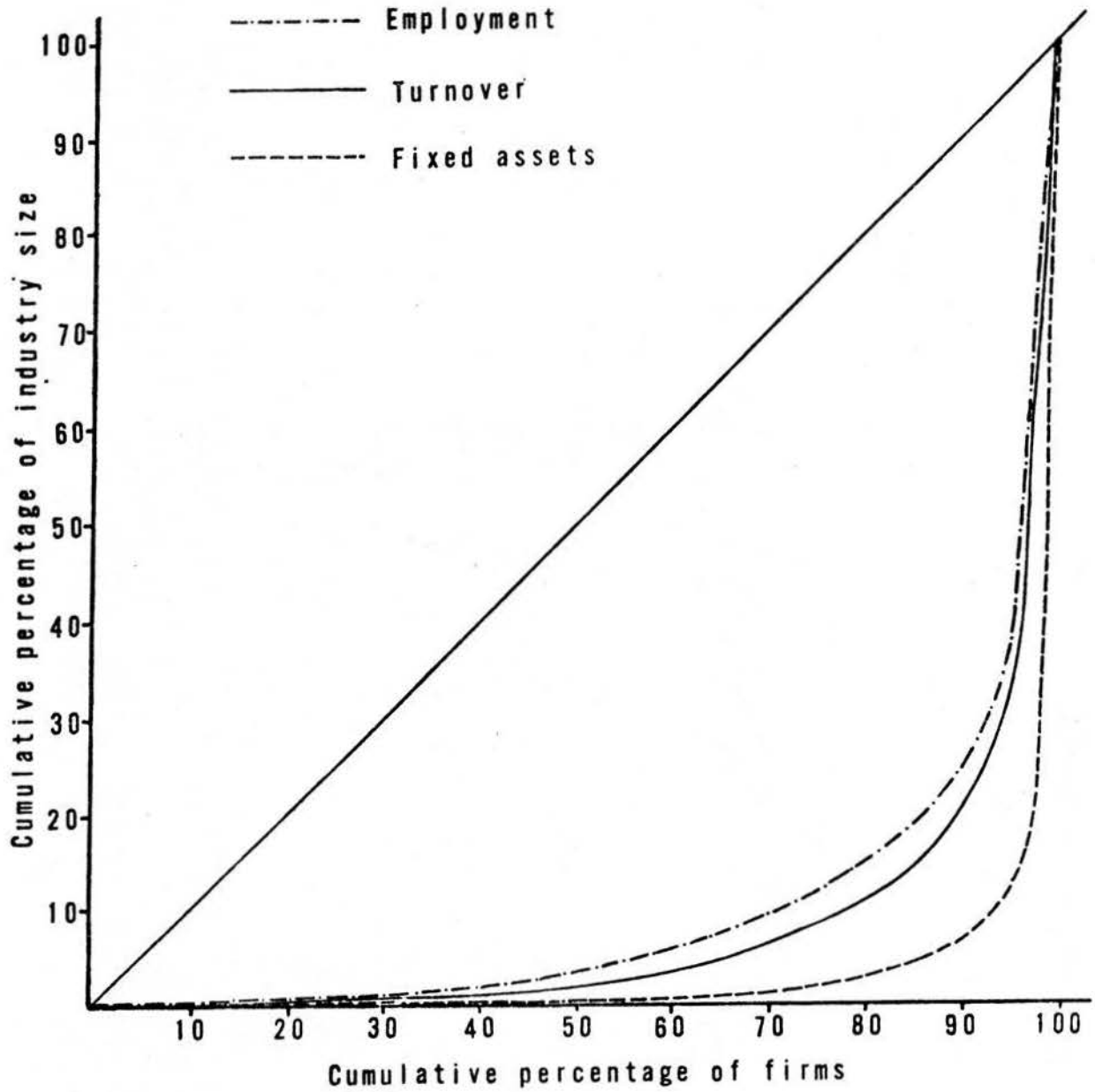


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN SOUTH AFIRCAN MANUFACTURING INDUSTRY 1971-72

37. BASIC METAL INDUSTRIES

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
12	5	66,5	65,4	88,4
23	10	76,7	75,5	93,5
34	15	83,2	81,5	95,6
45	20	87,9	85,4	97,0
56	25	91,3	88,3	97,8
67	30	93,5	90,7	98,4
78	35	95,0	92,5	98,9
89	40	96,1	94,0	99,2
100	45	97,0	95,3	99,4
111	50	97,7	96,2	99,5
123	55	98,3	97,1	99,7
134	60	98,7	97,7	99,8
145	65	99,0	98,2	99,8
156	70	99,3	98,7	99,9
167	75	99,5	99,1	99,9
178	80	99,7	99,4	99,9
189	85	99,8	99,7	99,9
200	90	99,9	99,8	99,9
211	95	99,9	99,9	99,9
222	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 37:
BASIC METAL INDUSTRIES 1971/72

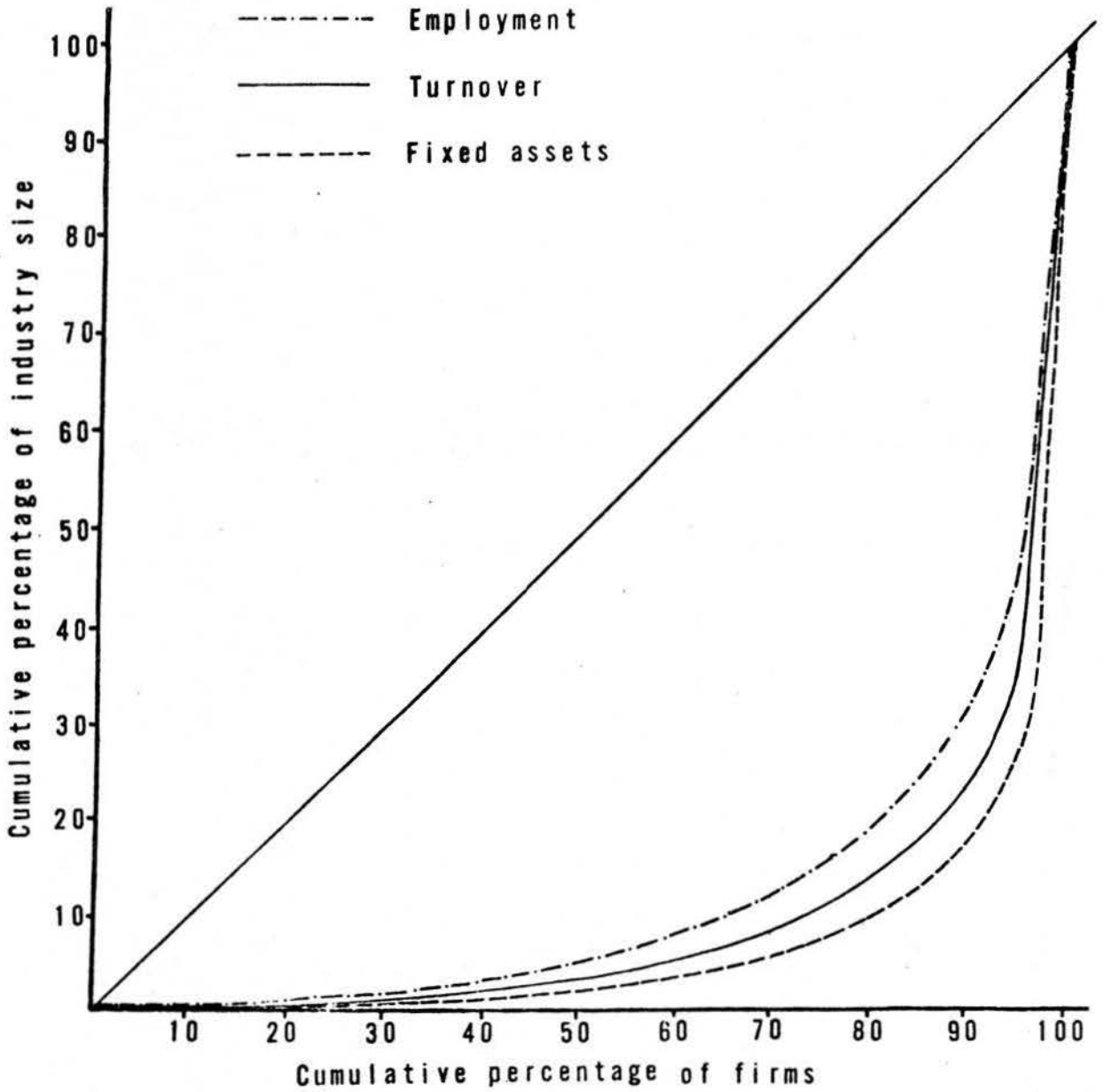


CUMULATIVE CONCENTRATION OF ECONOMIC POWERS IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

38. MANUFACTURE OF FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT

Numer of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
197	5	64,7	55,4	72,6
395	10	76,5	68,6	82,7
592	15	82,7	76,2	87,5
789	20	86,8	81,3	90,4
987	25	89,7	85,0	92,4
1 184	30	91,9	88,0	94,0
1 381	35	93,7	90,3	95,2
1 578	40	95,0	92,2	96,2
1 776	45	96,0	93,7	97,0
1 973	50	96,9	94,9	97,7
2 170	55	97,6	96,0	98,2
2 368	60	98,2	96,9	98,7
2 565	65	98,7	97,6	99,0
2 762	70	99,1	98,2	99,3
2 960	75	99,4	98,7	99,6
3 157	80	99,6	99,1	99,7
3 354	85	99,8	99,5	99,9
3 551	90	99,9	99,7	99,9
3 749	95	99,9	99,9	99,9
3 946	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 38:
FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT 1971/72

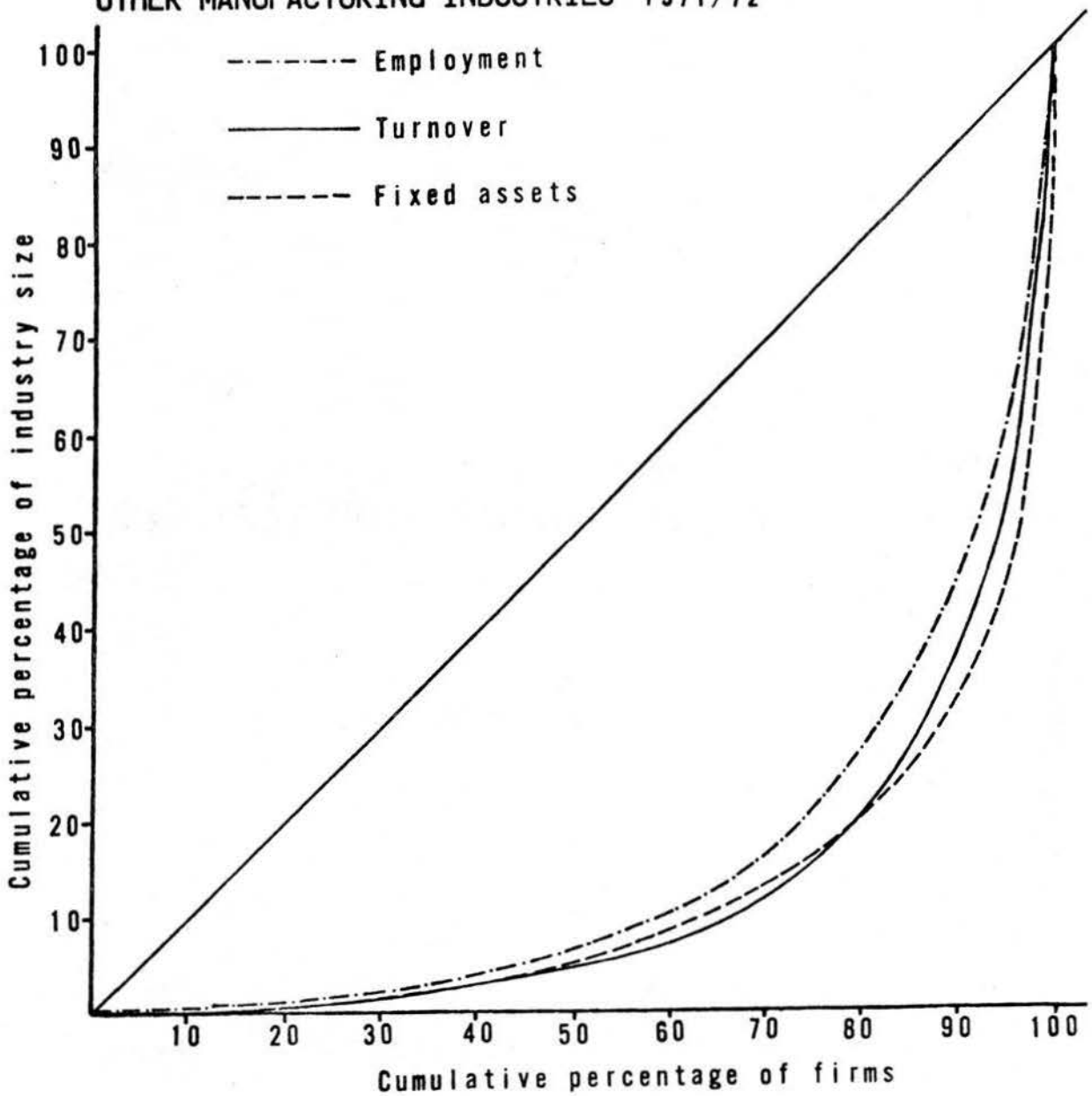


CUMULATIVE CONCENTRATION OF ECONOMIC POWERS IN SOUTH AFRICAN MANUFACTURING INDUSTRY 1971-72

39. OTHER MANUFACTURING INDUSTRIES

Number of firms	Cumulative percentage of firms	Cumulative percentage of turnover	Cumulative percentage of employment	Cumulative percentage of fixed assets
29	5	46,1	40,0	52,9
57	10	62,3	54,4	66,7
85	15	72,7	64,1	74,4
113	20	80,0	70,8	79,6
141	25	84,8	76,2	83,5
169	30	88,2	80,6	86,6
198	35	90,7	84,3	89,3
226	40	92,7	87,1	91,4
254	45	94,2	89,5	93,1
282	50	95,4	91,4	94,6
310	55	96,4	93,1	95,9
338	60	97,3	94,5	96,9
366	65	98,0	95,8	97,8
395	70	98,5	96,8	98,5
423	75	99,0	97,7	99,0
451	80	99,3	98,4	99,4
479	85	99,6	98,9	99,7
507	90	99,8	99,4	99,9
535	95	99,9	99,8	99,9
563	100	100,0	100,0	100,0

LORENZ CURVES FOR INDUSTRY NUMBER 39:
OTHER MANUFACTURING INDUSTRIES 1971/72



APPENDIX 3

CONCENTRATION INDICES FOR THREE-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

This Appendix contains the indices for four variants of the common concentration ratio, each based on three variables as well as the Horvath comprehensive measure of concentration based on turnover.

Measures:	Variables:
CR_3	Turnover
CR_{10}	Employment
$CR_{70\%}$	Fixed assets
$CR_{80\%}$	
CCI	

CONCENTRATION INDEXES FOR THREE DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA 1971 - 72

Major group No.	Title of category	Number of firms	Turnover: Turnover of the x largest firms x=3	x=10	Turnover: Number of largest firms with at least y% of total turnover y=70	y=80	Employment: Employment of the x largest firms x=3	x=10	Employment: Number of largest firms with at least y% total employment y=70	y=80%	Fixed Assets: Fixed assets employed by the x largest firms x=3	x=10	Fixed Assets: Number of largest firms employing at least y% fixed assets y=70%	y=80%	Horvath comprehensive measure of concentration based on turnover
311	Food	1 195	.0957	.2142	108	166	.0729	.1851	139	221	.1261	.2821	73	119	.0593
312	Food products not elsewhere classified	160	.2330	.4851	23	31	.1742	.3736	31	42	.2799	.5370	19	27	.1476
313	Beverage industries	233	.5002	.7486	9	15	.3235	.5598	22	39	.4283	.6694	13	25	.2982
314	Tobacco products	15	.9840	.9999	2	2	.8812	.9920	2	2	.9453	.9994	2	2	.7828
321	Textiles	518	.1331	.2858	70	104	.1658	.2891	69	107	.1374	.2938	51	73	.0914
322	Wearing apparel, except footwear	1 189	.0729	.1533	142	205	.0713	.1607	162	239	.1319	.2775	90	150	.0499
323	Leather and products of leather, leather substitutes and fur except footwear and weaving apparel	126	.1941	.4248	24	36	.1328	.3411	34	47	.2676	.6061	13	19	.1174
324	Footwear	120	.2880	.5015	22	32	.2617	.4872	23	32	.3789	.6368	14	25	.1662
331	Wood and wood and cork products, except furniture	532	.1391	.2730	86	131	.0879	.1976	102	146	.1911	.4422	41	69	.0826
332	Furniture and fixtures, except primarily of metal	643	.1929	.3054	87	132	.1239	.2042	117	172	.2460	.3733	65	114	.1611
341	Paper and paper products	137	.3290	.5435	19	28	.2505	.4827	23	32	.4787	.8089	7	10	.2461
342	Printing, publishing and allied industries	844	.2060	.3840	75	143	.1669	.3190	111	194	.3332	.4909	37	89	.1334
351	Industrial chemicals	123	.4215	.6801	11	19	.3389	.6278	14	20	.5297	.7550	8	13	.2902
352	Other chemical products	354	.2705	.4249	44	66	.2629	.4297	47	73	.3676	.5793	21	38	.1575
353	Petroleum refineries	23	.7672	.9833	3	4	.7465	.9718	3	4	.8170	.9976	3	3	.5724
354	Miscellaneous products of petroleum and coal	30	.4068	.8679	7	9	.4361	.7973	7	11	.4193	.8439	7	9	.2894
355	Rubber products	60	.5862	.8778	5	6	.4633	.9139	5	7	.6097	.9946	4	5	.3759
356	Plastic products not elsewhere classified	248	.1235	.3154	44	65	.1026	.2646	58	85	.1699	.3659	36	54	.0722
361	Pottery, china and earthenware	37	.4487	.9019	6	7	.4575	.8271	6	9	.5136	.9383	5	6	.3220
362	Glass and glass products	38	.7724	.9169	3	4	.7787	.9272	3	4	.7716	.9771	3	4	.5847
369	Other non-metallic mineral products	666	.1758	.3968	39	65	.1483	.3168	100	169	.4286	.6444	15	27	.0975
371	Iron and steel basic industries	133	.5916	.7658	7	13	.5665	.7396	8	16	.8549	.9302	2	2	.5026
372	Non-ferrous metal basic industries	88	.3389	.6628	12	17	.3036	.6100	15	22	.5896	.8664	5	8	.2102

381 / .....

Major group No.	Title of category	Number of firms	Turnover				Employment				Fixed Assets				Horvath comprehensive measure of concentration based on turnover
			Turnover of the x largest firms		Number of largest firms with at least y% of total turnover		Employment of the x largest firms		Number of largest firms with at least y% total employment		Fixed assets employed by the x largest firms		Number of largest firms employing at least y% fixed assets		
			x=3	x=10	y=70	y=80	x=3	x=10	y=70	y=80	x=3	x=10	y=70	y=80	
381	Fabricated metal products except machinery and equipment	1 889	.1051	.2000	193	332	.0809	.1686	259	428	.1771	.2929	132	251	.0722
382	Machinery except electrical	877	.0917	.2355	100	161	.1234	.2365	120	196	.1689	.2943	77	127	.0530
383	Electrical machinery, apparatus appliances and supplies	457	.2312	.4347	40	67	.1824	.3806	54	87	.2252	.4846	23	37	.1576
384	Motor vehicles parts and accessories	529	.3700	.6577	13	25	.2364	.4776	35	62	.2900	.6281	13	19	.2271
385	Transport equipment except motor vehicles parts and accessories	112	.5457	.7974	7	11	.5085	.7871	7	11	.7011	.8983	3	5	.3517
386	Professional and scientific and measuring and controlling equipment	93	.5143	.6967	11	17	.5597	.7884	7	11	.7748	.8653	2	5	.3782
390	Other manufacturing industries	563	.1220	.2585	77	113	.0705	.2003	110	165	.1301	.3014	67	113	.0835

APPENDIX 4

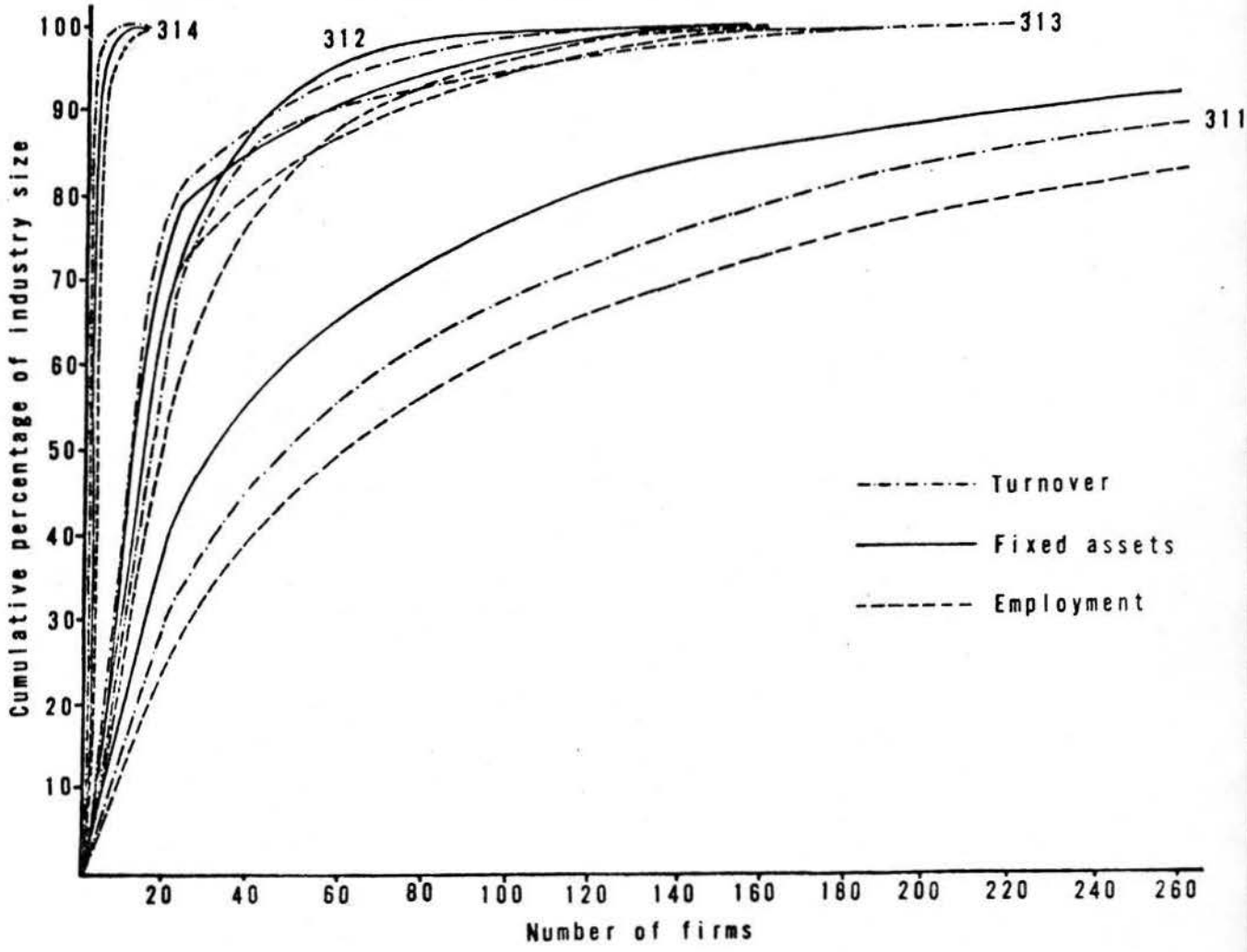
THE CONCENTRATION CURVES AND CUMULATIVE CONCENTRATION DATA FOR THREE-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

The concentration curves, based on three variables, for all the three-digit manufacturing industries are included.

Quantitative concentration data for all the tnree-digit industries, based on all three variables are included. In the tables containing the cumulative concentration data firms are arranged from large to small.

Where it is meaningfully possible the Lorenz curves based on this quantitative data are included. Tne firms included in the cumulative percentage of firms on the horisontal axis of the Lorenz curves are arranged from small to large.

CONCENTRATION CURVES FOR INDUSTRIES NUMBER 311 TO 314: MANUFACTURE OF FOOD, BEVERAGES AND TOBACCO.

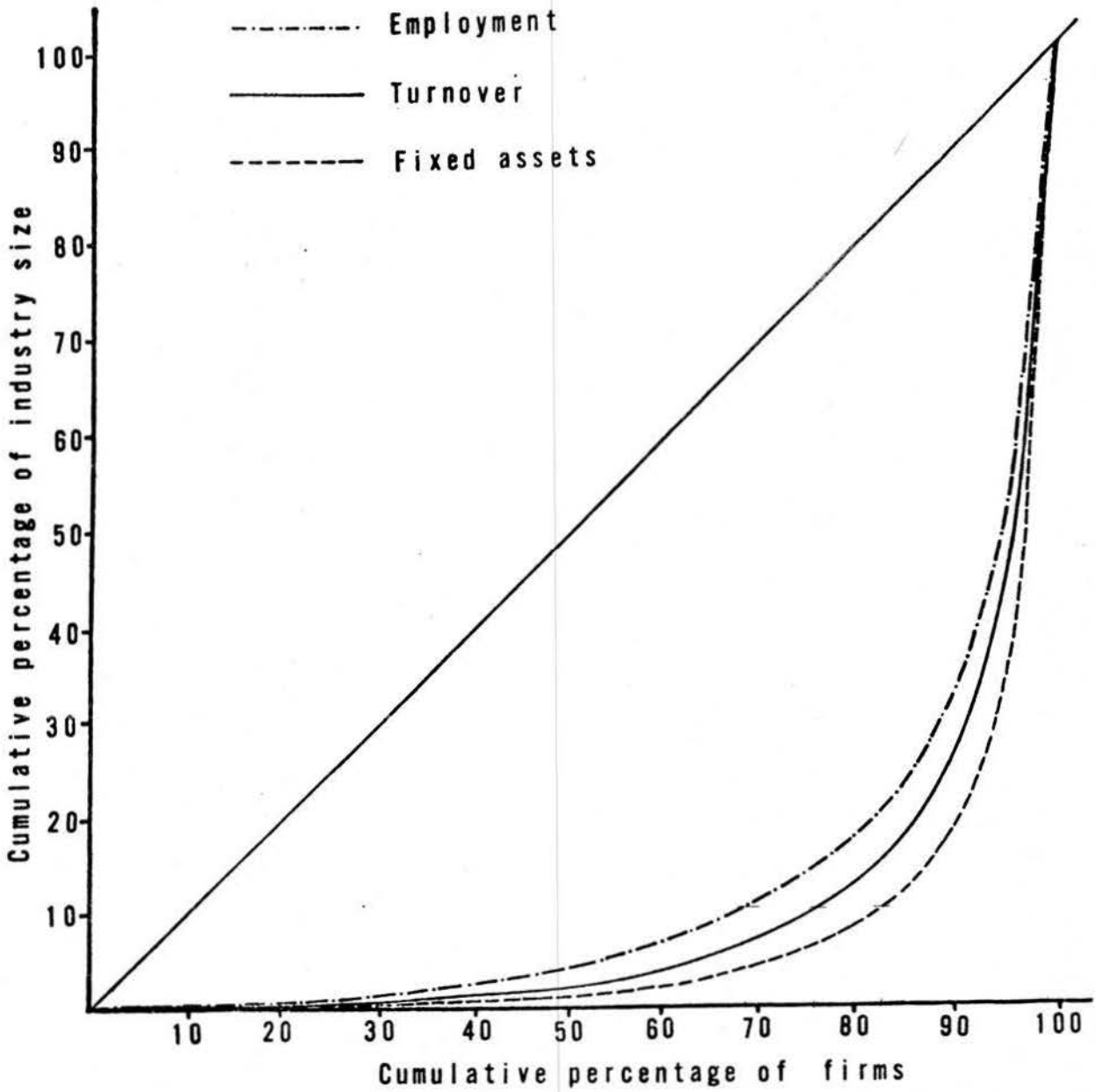


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

311 FOOD MANUFACTURING

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURNOVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
60	5	56,40	49,43	65,72
120	10	72,10	66,47	80,24
180	15	81,44	75,82	87,58
239	20	86,85	81,61	91,41
299	25	90,36	85,65	93,71
359	30	92,79	88,60	95,24
419	35	94,52	90,92	96,35
478	40	95,80	92,74	97,15
538	45	96,79	94,25	97,79
598	50	97,56	95,49	98,31
658	55	98,19	96,48	98,73
717	60	98,67	97,27	99,06
777	65	99,07	97,94	99,34
837	70	99,38	98,49	99,56
897	75	99,61	98,95	99,72
956	80	99,78	99,33	99,84
1016	85	99,90	99,62	99,93
1076	90	99,97	99,83	99,98
1136	95	100,00	99,98	100,00
1195	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 311:
FOOD MANUFACTURING 1971/72

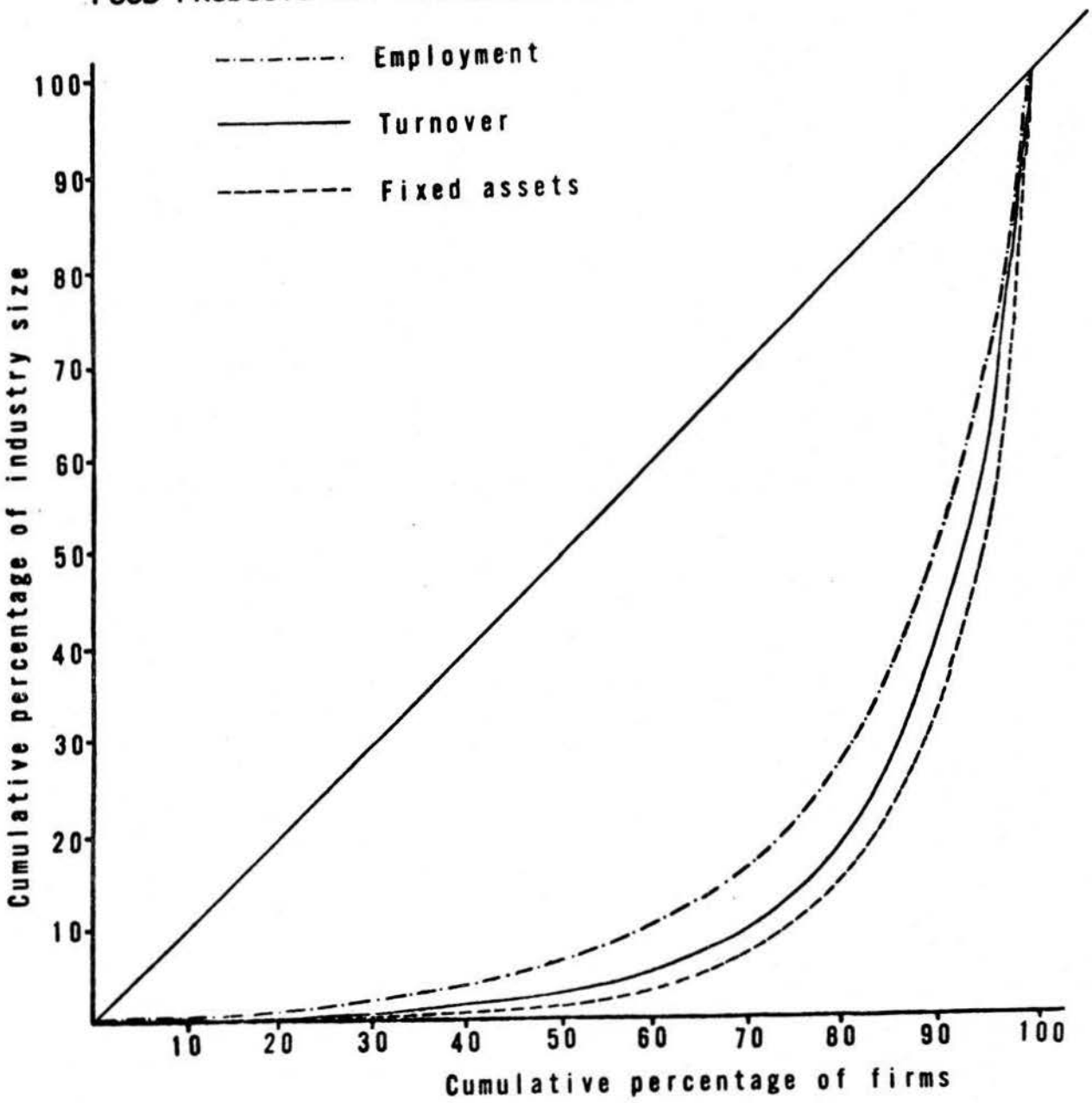


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

312 MANUFACTURING OF FOOD PRODUCTS NOT ELSEWHERE CLASSIFIED 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
8	5	42,12	32,30	48,43
16	10	59,88	49,23	66,44
24	15	71,95	61,86	76,88
32	20	80,43	71,47	84,06
40	25	86,83	78,81	89,44
48	30	90,29	83,85	92,88
56	35	92,67	87,26	95,27
64	40	94,54	89,64	96,94
72	45	95,92	91,60	97,97
80	50	96,83	93,22	98,68
88	55	97,63	94,57	98,77
96	60	98,22	95,72	98,88
104	65	98,66	96,68	99,00
112	70	99,03	97,49	99,21
120	75	99,33	98,15	99,40
128	80	99,53	98,71	99,59
136	85	99,68	99,20	99,67
144	90	99,77	99,59	99,80
152	95	99,81	99,85	99,95
160	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 312:
FOOD PRODUCTS NOT ELSEWHERE CLASSIFIED 1971/72

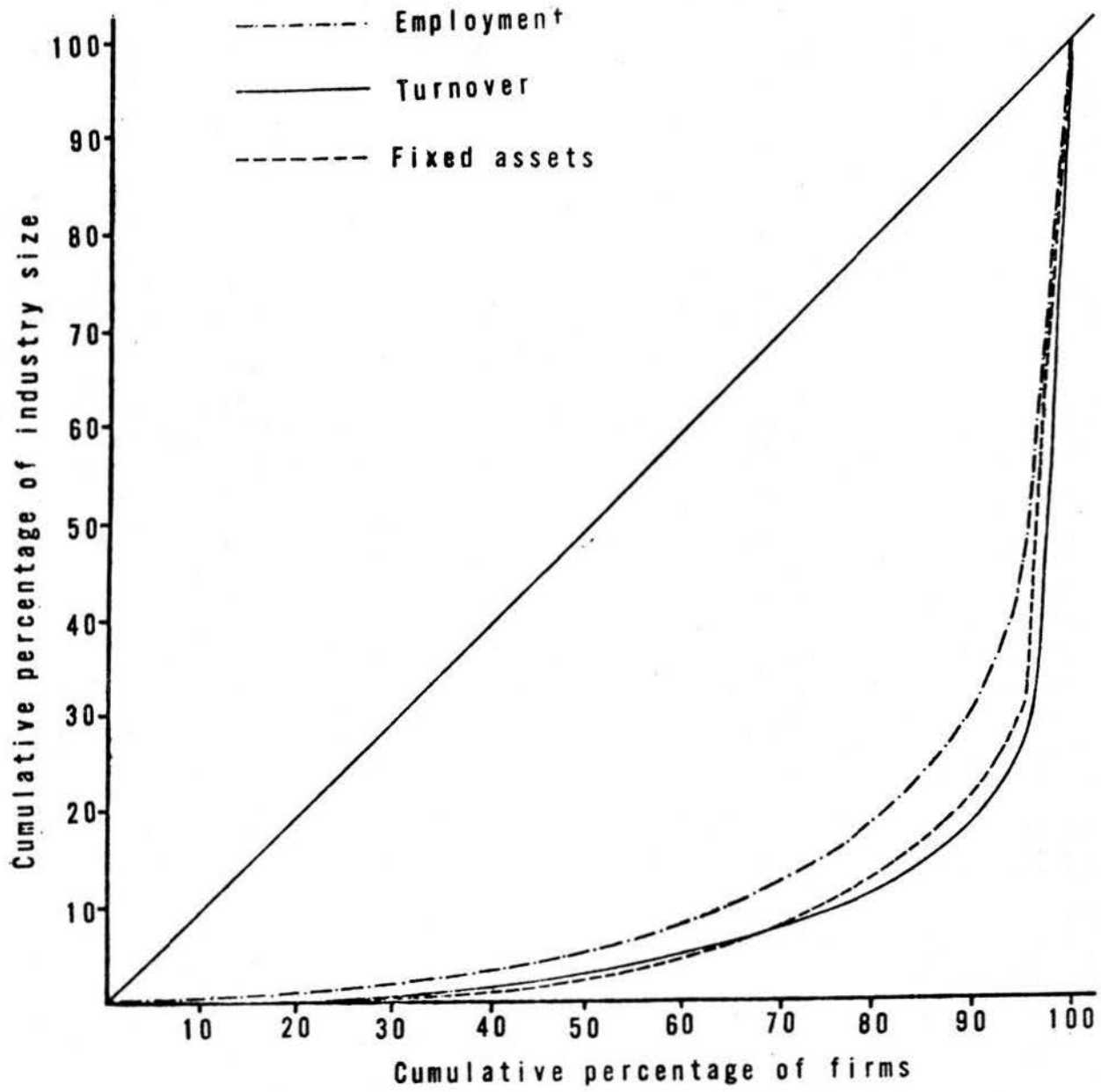


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

313 BEVERAGE INDUSTRIES 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
12	5	74,27	57,70	69,60
24	10	82,10	69,95	78,33
35	15	85,57	76,09	82,91
47	20	88,17	80,84	86,51
59	25	90,36	84,57	89,44
70	30	92,00	87,24	91,64
82	35	93,52	89,66	93,57
94	40	94,87	91,64	95,17
105	45	95,95	93,11	96,31
117	50	96,40	94,42	97,32
129	55	96,59	95,49	98,09
140	60	98,38	96,34	98,63
152	65	98,90	97,12	99,01
164	70	99,30	97,74	99,31
175	75	99,57	98,22	99,52
187	80	99,76	98,69	99,68
199	85	99,89	99,09	99,77
210	90	99,96	99,40	99,82
222	95	99,99	99,67	99,84
233	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 313:
BEVERAGE INDUSTRIES 1971/72

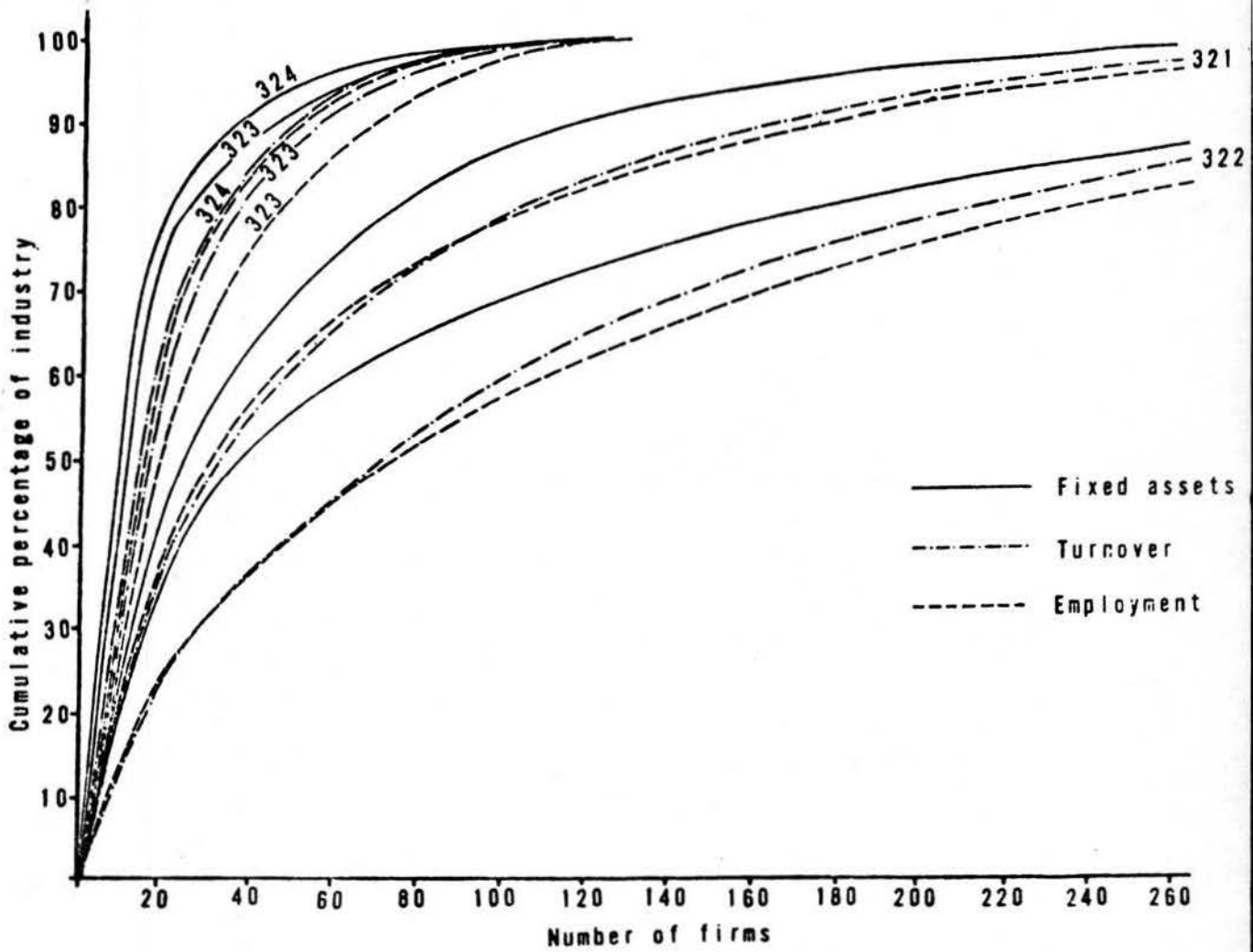


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

314 MANUFACTURE OF TOBACCO PRODUCTS 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
3	20	98,40	88,12	94,53
4	27	98,99	91,17	97,64
6	40	99,67	95,57	98,96
8	53	99,90	98,18	99,73
10	67	99,99	99,20	99,94
12	80	100,00	99,57	100,00
14	93	100,00	99,95	100,00
15	100	100,00	100,00	100,00

CONCENTRATION CURVES FOR INDUSTRIES NUMBER 321 TO 324: TEXTILE, WEARING APPAREL AND LEATHER INDUSTRIES 1971/72

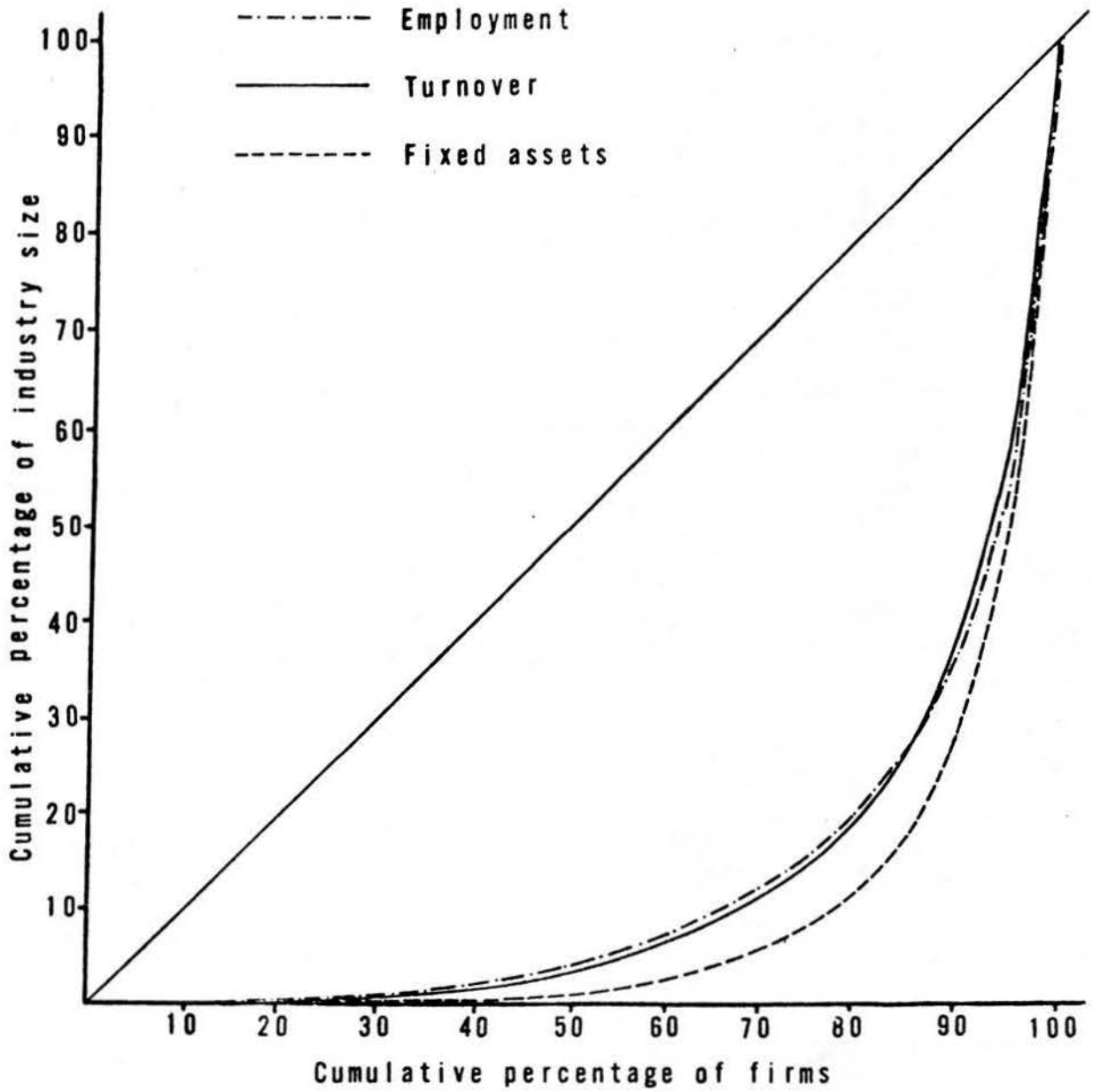


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

321 MANUFACTURE OF TEXTILES 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
26	5	44,87	46,75	52,43
52	10	62,42	63,32	71,02
78	15	73,03	73,00	81,88
104	20	80,22	79,42	87,76
130	25	85,34	84,04	91,73
156	30	89,03	87,61	94,22
182	35	91,69	90,44	95,96
208	40	93,78	92,39	97,17
234	45	95,44	94,26	98,04
259	50	96,68	95,58	98,66
285	55	97,65	96,69	99,13
311	60	98,37	97,59	99,48
337	65	98,87	98,29	99,71
363	70	99,21	98,83	99,84
389	75	99,46	99,22	99,93
415	80	99,64	99,53	99,98
441	85	99,77	99,76	99,99
467	90	99,85	99,93	100,00
493	95	99,91	99,99	100,00
518	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 321:
MANUFACTURE OF TEXTILES 1971/72

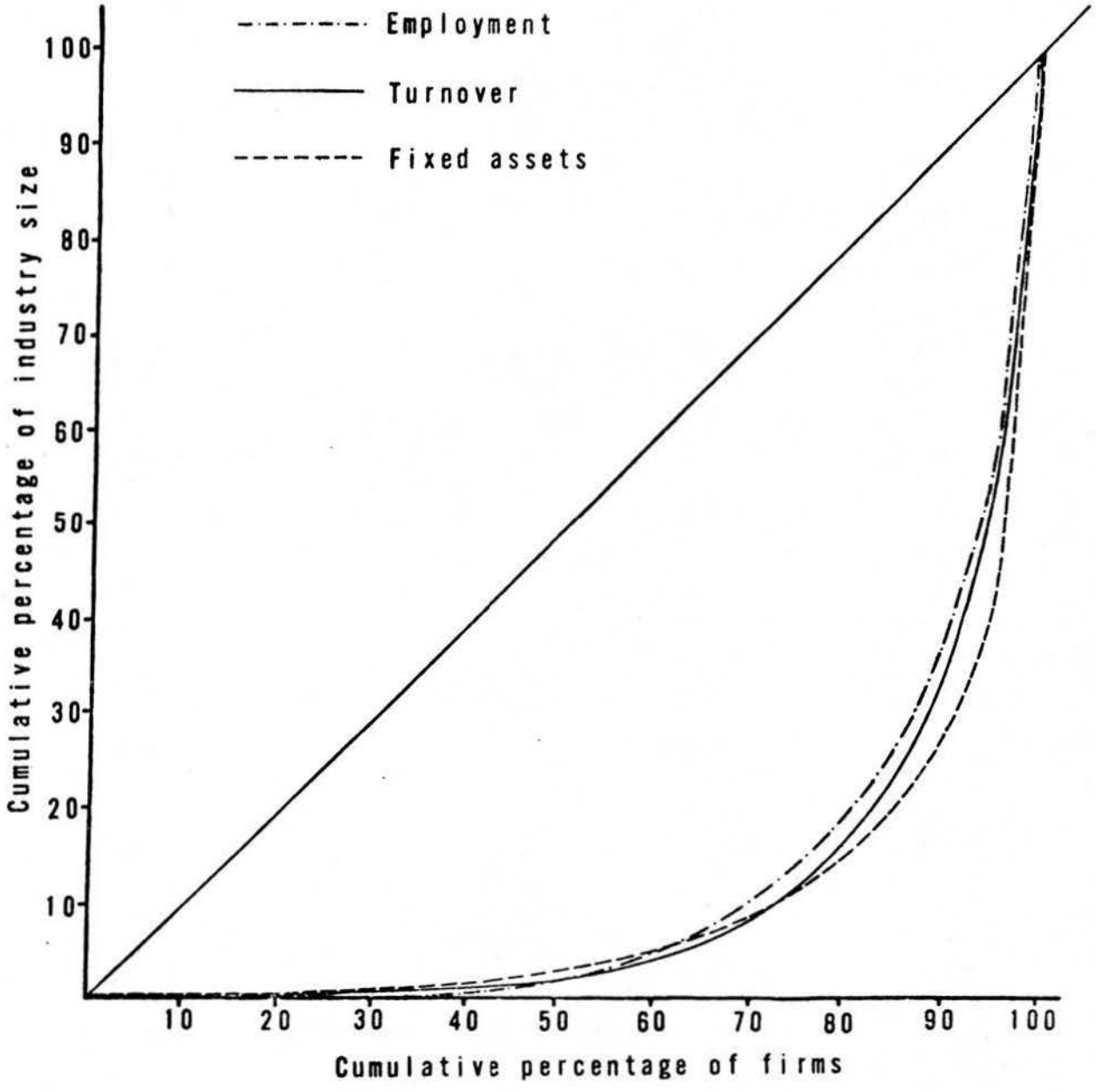


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

322 MANUFACTURE OF WEARING APPAREL, EXCEPT FOOTWEAR 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
60	5	46,28	45,74	58,15
119	10	64,35	61,87	71,71
179	15	75,85	72,68	79,49
238	20	82,97	79,94	84,48
298	25	88,14	85,55	88,27
357	30	91,73	89,60	91,09
417	35	94,07	92,72	93,21
476	40	95,66	95,07	94,80
535	45	96,82	96,74	95,99
595	50	97,68	97,90	96,96
654	55	98,31	98,60	97,70
714	60	98,78	99,11	98,23
773	65	99,12	99,47	98,67
833	70	99,38	99,75	98,89
892	75	99,57	99,98	99,07
952	80	99,72	99,99	99,20
1011	85	99,83	100,00	99,28
1071	90	99,92	100,00	99,33
1130	95	99,97	100,00	99,35
1189	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 322:
WEARING APPAREL, EXCEPT FOOTWEAR 1971/72

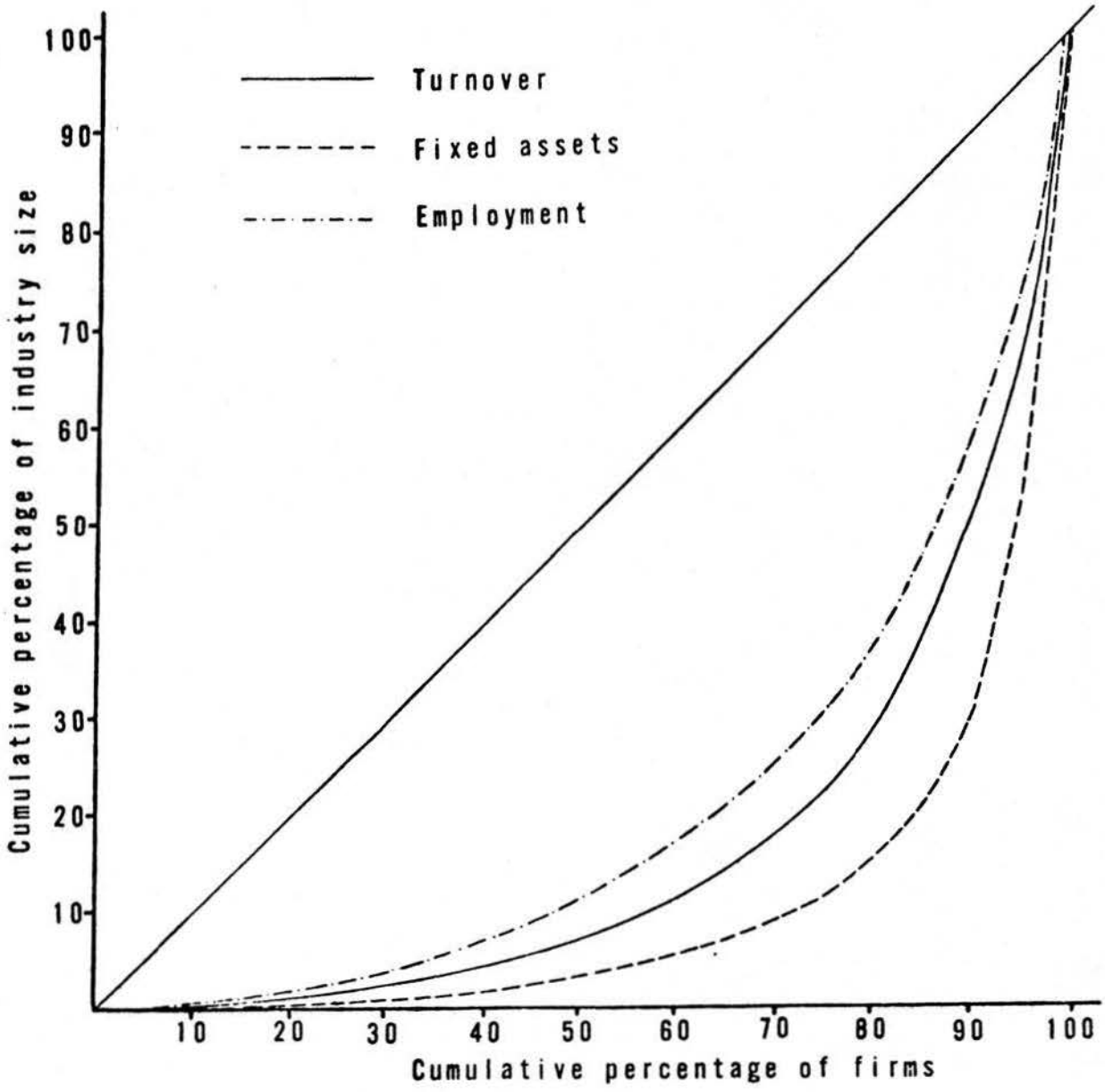


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

323 MANUFACTURE OF LEATHER AND PRODUCTS OF LEATHER, LEATHER SUBSTITUTES AND FUR, EXCEPT FOOTWEAR AND WEARING APPAREL. 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
7	5	34,14	26,14	47,91
13	10	48,57	41,54	70,00
19	15	60,78	52,24	79,39
26	20	70,82	62,12	84,48
32	25	76,89	68,42	88,29
38	30	81,42	73,77	90,72
45	35	85,40	78,86	92,69
51	40	88,29	82,44	94,23
57	45	90,82	85,53	95,42
63	50	93,00	88,11	96,36
70	55	94,71	90,83	97,37
76	60	95,88	92,69	98,00
82	65	96,90	94,32	98,42
89	70	97,85	95,97	98,89
95	75	98,50	97,12	99,20
101	80	99,04	97,97	99,47
108	85	99,53	98,75	99,69
114	90	99,80	99,17	99,80
120	95	99,94	99,44	99,88
126	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 323:
LEATHER AND PRODUCTS OF LEATHER SUBSTITUTES
AND FUR, EXCEPT FOOTWEAR AND WEARING APPAREL 1971/72

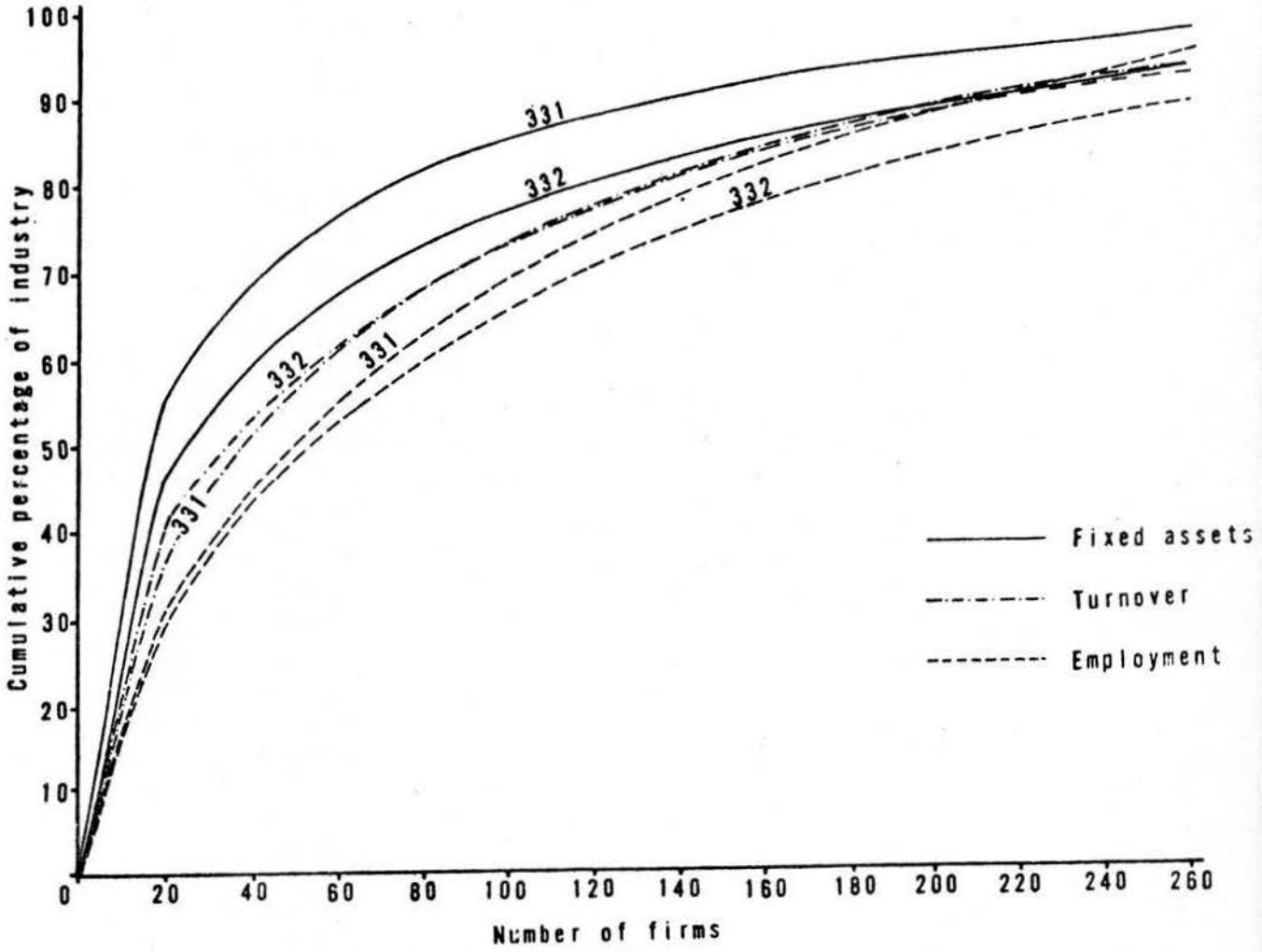


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

324 MANUFACTURE OF FOOTWEAR : 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
6	5	40,16	37,86	53,57
12	10	54,46	53,18	67,34
18	15	65,57	64,28	74,90
24	20	73,20	72,37	79,61
30	25	78,83	78,84	83,32
36	30	83,46	82,98	86,32
42	35	87,04	86,58	88,91
48	40	90,06	89,61	91,15
54	45	92,49	91,87	92,91
60	50	94,46	93,60	94,36
66	55	95,92	95,11	95,64
72	60	97,07	96,30	96,74
78	65	98,03	97,29	97,68
84	70	98,73	98,16	98,41
90	75	99,21	98,82	99,02
96	80	99,54	99,29	99,46
102	85	99,78	99,62	99,77
108	90	99,91	99,82	99,92
114	95	99,97	99,93	99,98
120	100	100,00	100,00	100,00

CONCENTRATION CURVES FOR INDUSTRIES NUMBER 331 AND 332:
WOOD AND WOOD PRODUCTS INCLUDING FURNITURE 1971/72

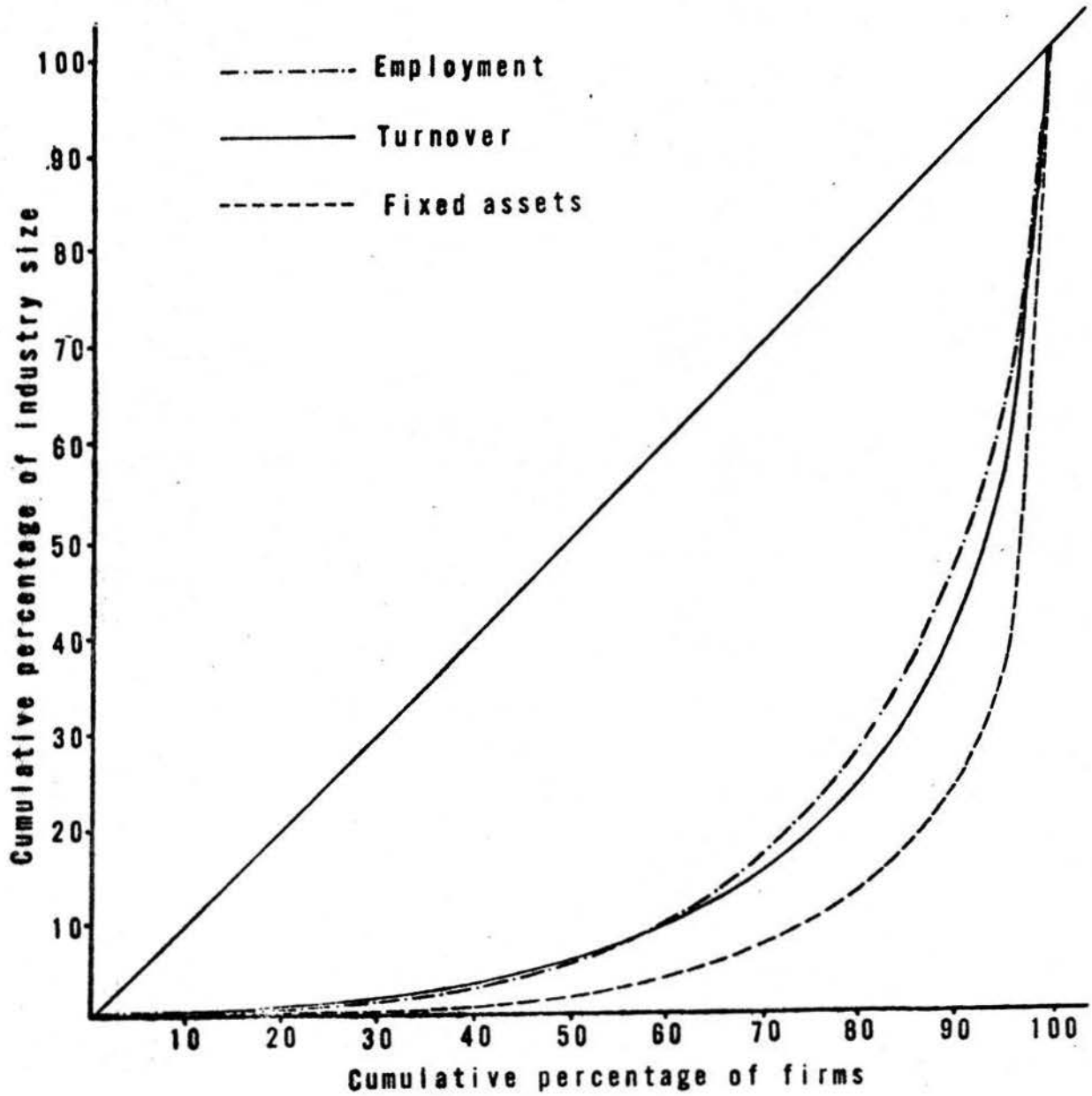


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

331 MANUFACTURE OF WOOD AND WOOD AND CORK PRODUCTS, EXCEPT FURNITURE.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
27	5	43,07	37,01	62,12
54	10	58,38	52,35	75,01
80	15	68,35	62,96	81,85
107	20	75,40	71,40	86,93
133	25	80,41	77,58	90,16
160	30	84,57	82,61	92,46
187	35	87,83	86,70	94,29
213	40	90,22	89,84	95,62
240	45	92,20	92,25	96,70
266	50	93,78	94,05	97,61
293	55	95,15	95,48	98,25
320	60	96,29	96,58	98,71
346	65	97,16	97,41	99,06
373	70	97,83	98,11	99,32
399	75	98,32	98,66	99,52
426	80	98,73	99,10	99,67
453	85	98,99	99,43	99,79
479	90	99,17	99,70	99,86
506	95	99,29	99,90	99,89
532	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 331:
WOOD AND CORK PRODUCTS - EXCEPT FURNITURE 1971/72

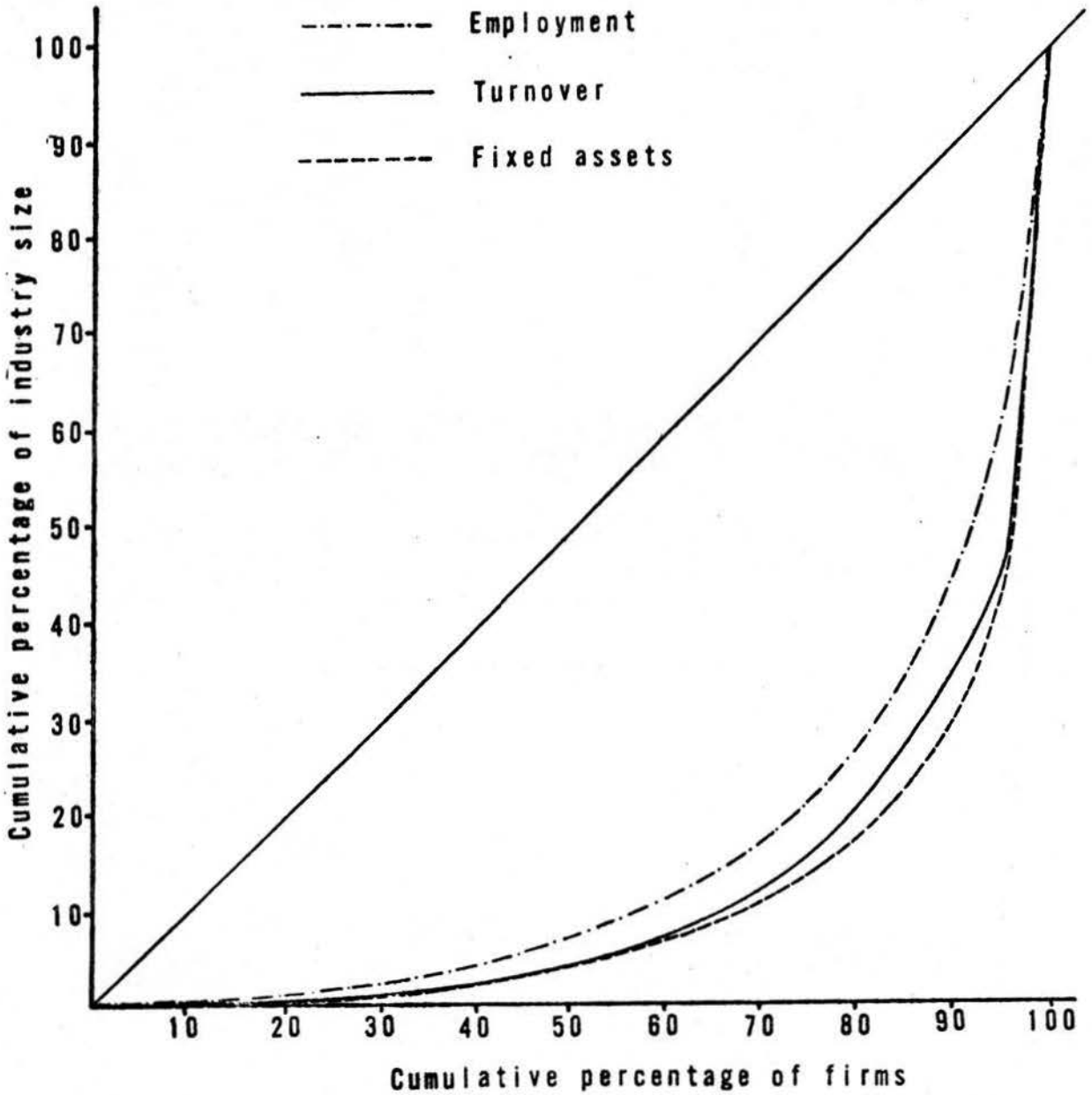


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

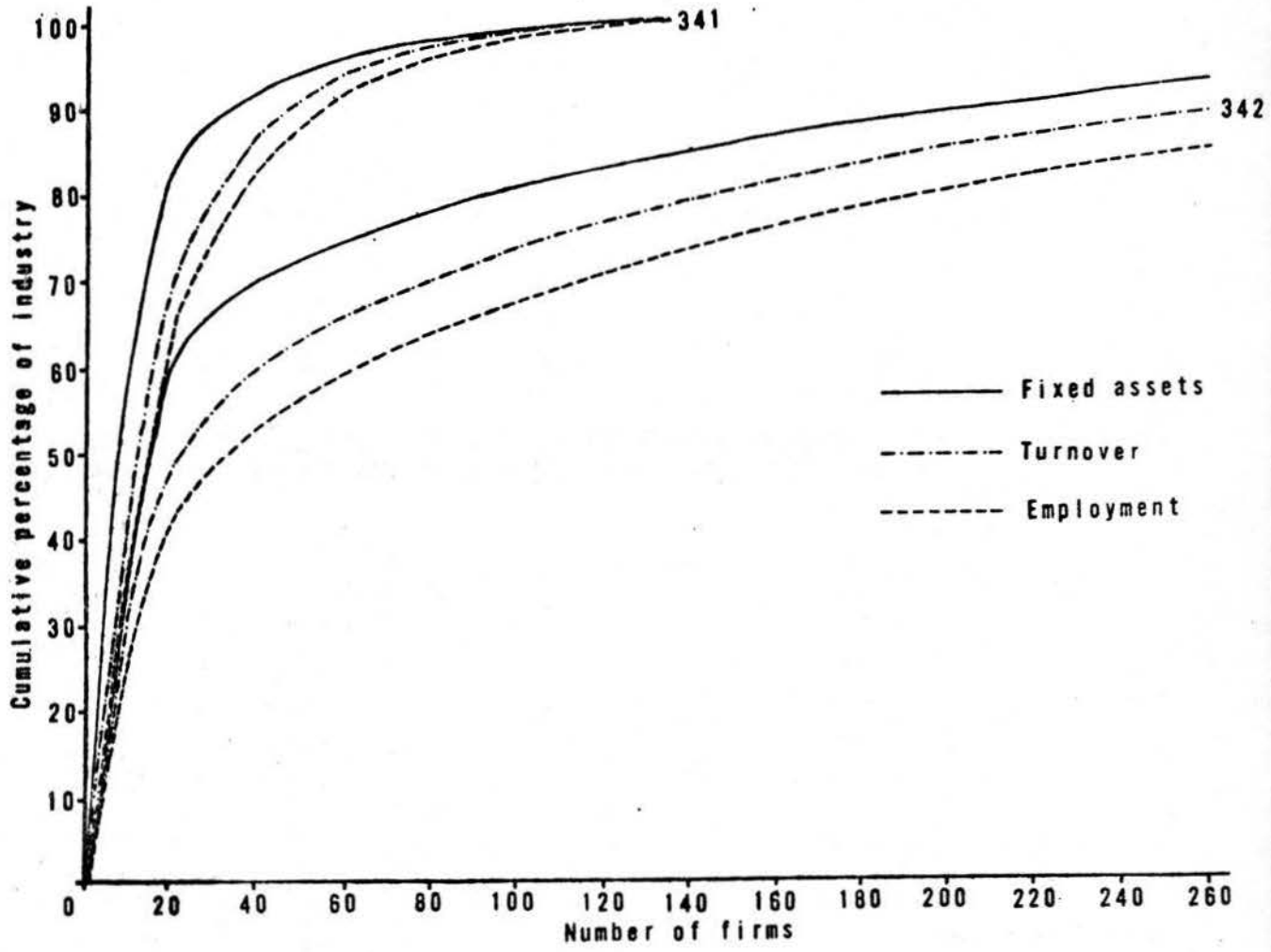
332 MANUFACTURE OF FURNITURE AND FIXTURES, EXCEPT PRIMARILY OF METAL 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
33	5	49,63	39,02	56,51
65	10	63,41	54,74	70,08
97	15	72,80	65,01	77,17
129	20	79,58	72,66	82,41
161	25	84,35	78,39	86,12
193	30	87,95	82,83	88,86
226	35	90,71	86,25	91,13
258	40	92,73	88,88	92,95
290	45	94,36	90,98	94,49
322	50	95,65	92,76	95,75
354	55	96,63	94,31	96,75
386	60	97,41	95,58	97,58
418	65	98,07	96,60	98,24
451	70	98,64	97,45	98,77
483	75	99,07	98,13	99,17
515	80	99,40	98,69	99,50
547	85	99,65	99,15	99,75
579	90	99,82	99,53	99,91
611	95	99,95	99,82	99,98
643	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 332:
FURNITURE AND FIXTURES, EXCEPT PRIMARILY OF METAL 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 341 AND 342: PAPER AND PAPER PRODUCTS PRINTING AND PUBLISHING 1971/72

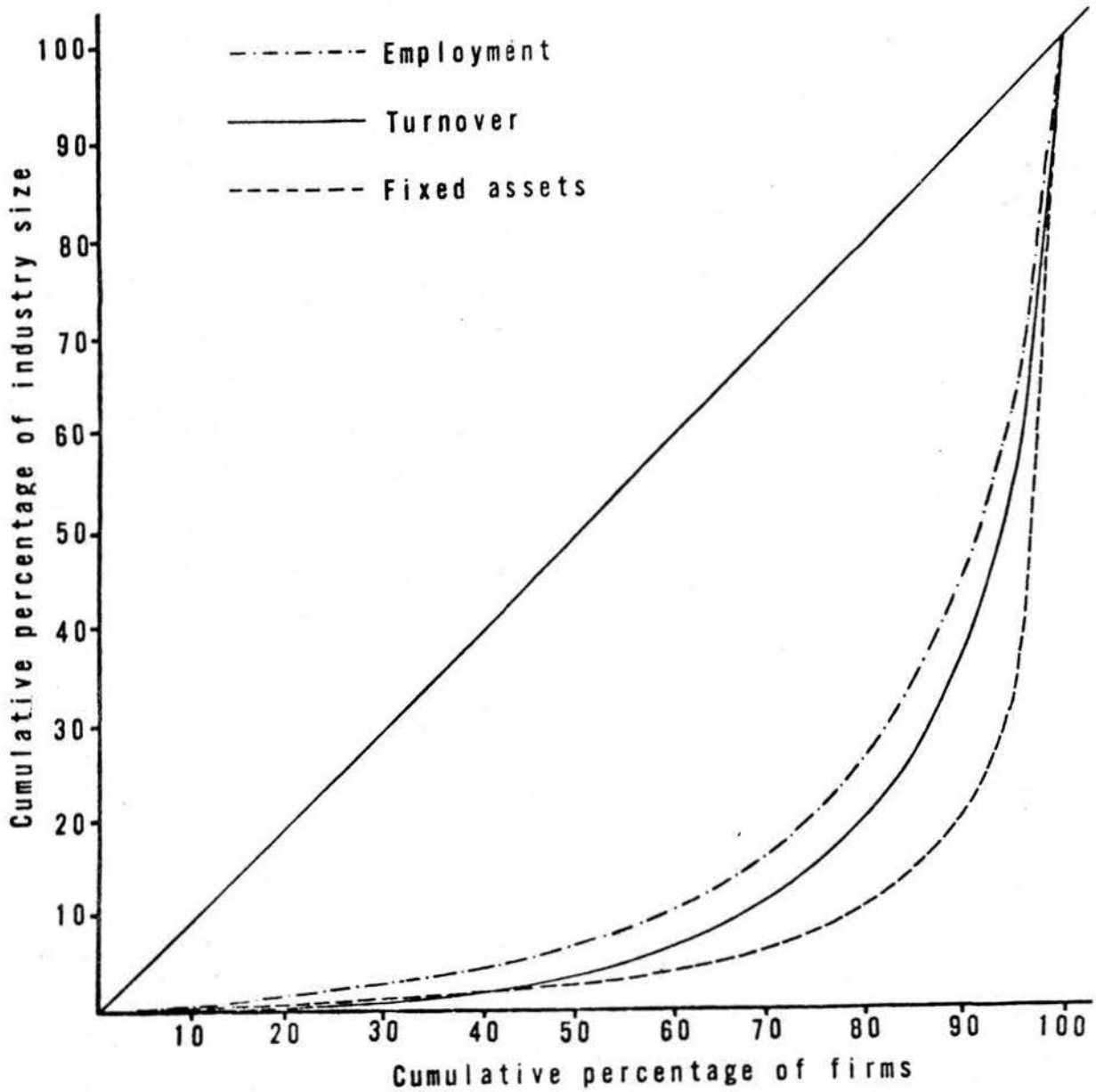


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

341 MANUFACTURE OF PAPER AND PAPER PRODUCTS 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
7	5	45,46	35,84	67,09
14	10	60,49	53,58	79,06
21	15	71,36	64,85	84,41
28	20	79,20	72,71	89,39
35	25	84,50	78,72	91,54
42	30	88,38	83,58	93,38
48	35	91,00	86,57	94,60
55	40	93,11	89,29	95,71
62	45	94,79	91,31	96,57
69	50	96,12	92,98	97,05
76	55	97,07	94,25	97,49
83	60	97,82	95,32	97,85
90	65	98,48	96,21	98,13
96	70	98,96	96,78	98,29
104	75	99,28	97,32	98,44
110	80	99,56	97,74	98,50
117	85	99,76	98,08	98,56
124	90	99,90	98,33	98,59
131	95	99,98	98,49	98,61
137	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 341:
PAPER AND PAPER PRODUCTS 1971/72

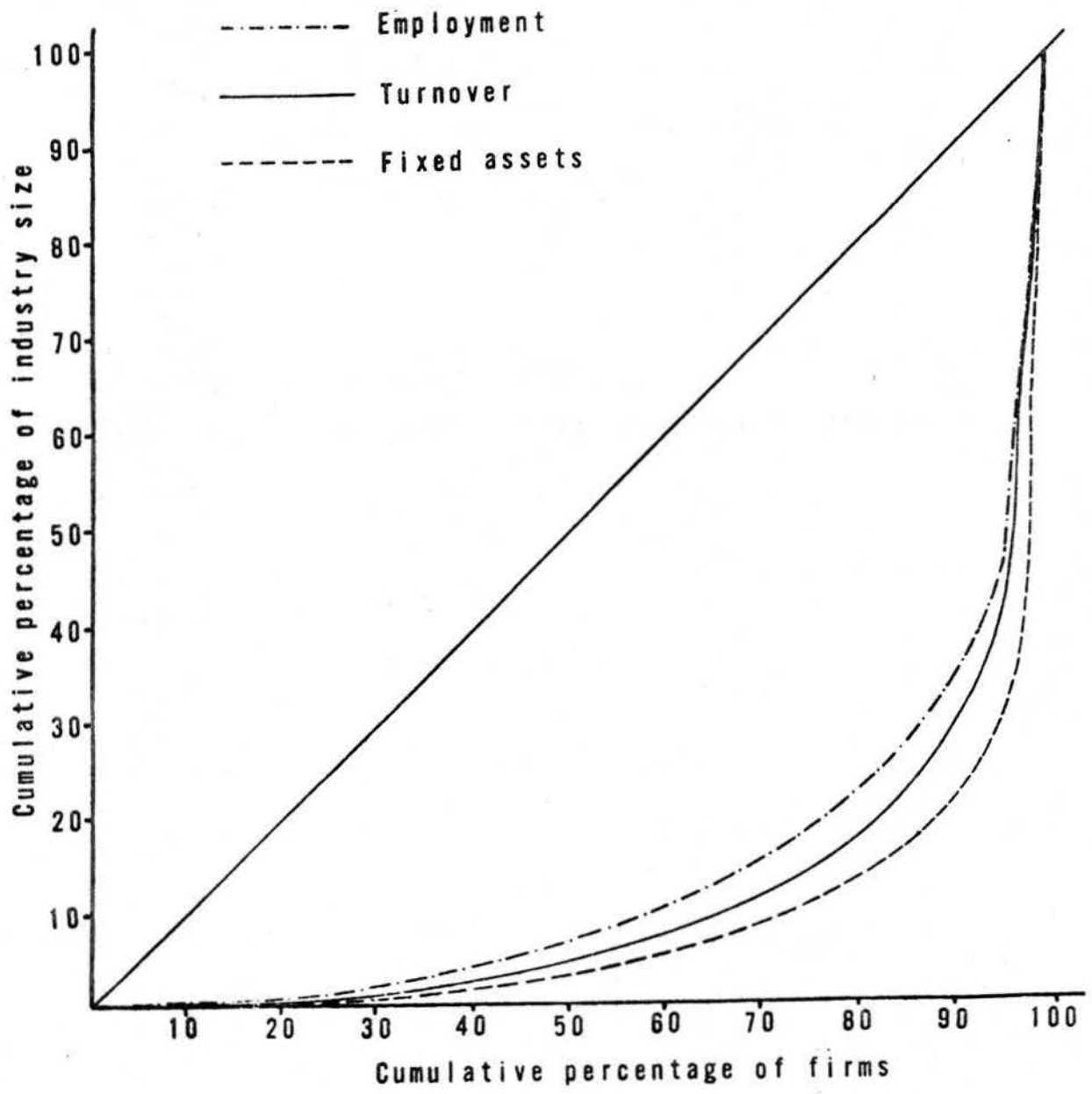


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

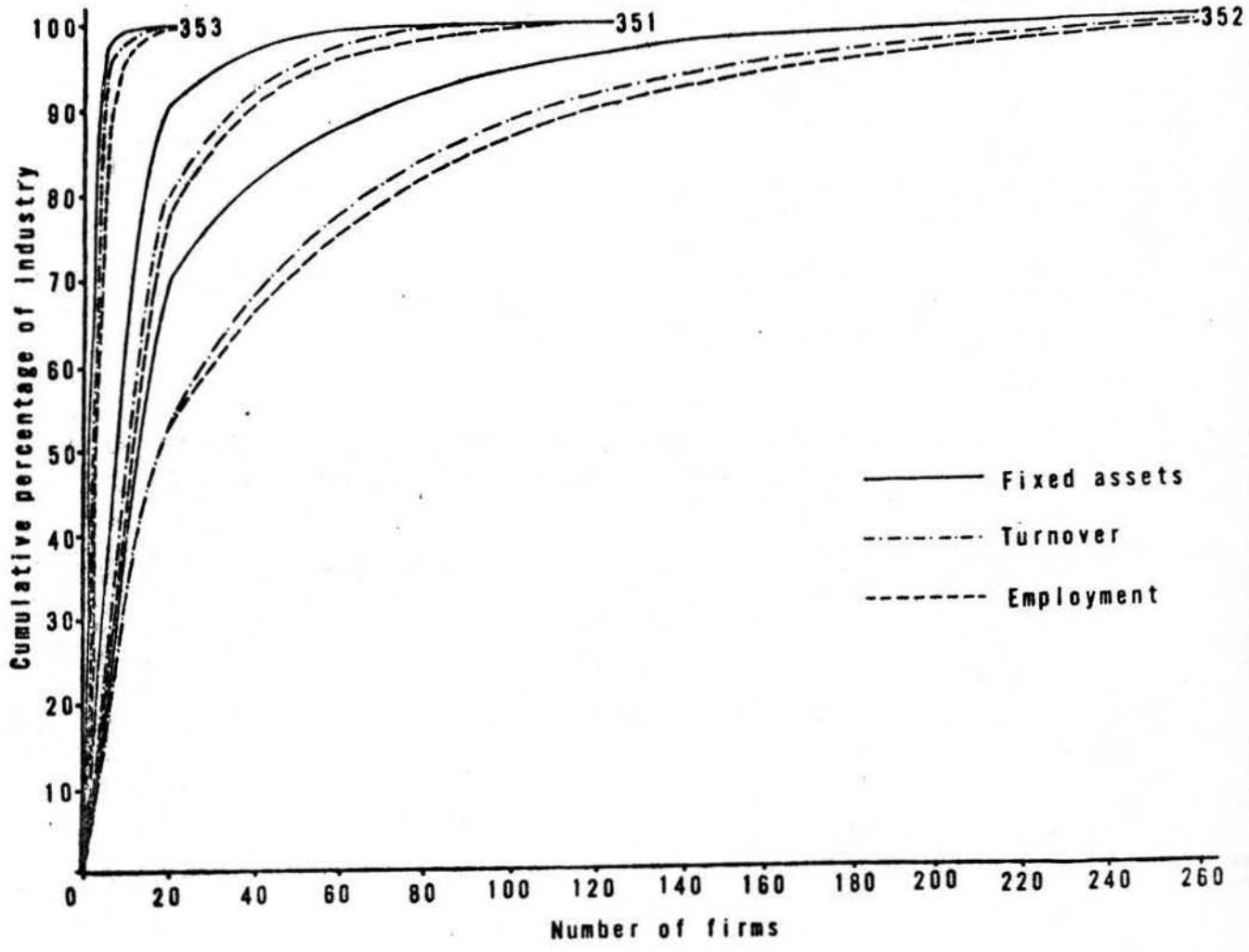
342 PRINTING, PUBLISHING AND ALLIED INDUSTRIES 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
43	5	61,15	54,97	70,63
85	10	71,22	65,67	78,28
127	15	77,65	72,44	83,15
169	20	82,19	77,55	86,63
211	25	85,67	81,50	89,39
254	30	88,41	84,77	91,45
296	35	90,54	87,41	93,11
338	40	92,33	89,64	94,49
380	45	93,83	91,54	95,62
422	50	95,12	93,14	96,59
465	55	96,24	94,57	97,36
507	60	97,14	95,74	98,00
549	65	97,87	96,79	98,51
591	70	98,45	97,70	98,93
633	75	98,93	98,50	99,29
676	80	99,32	99,15	99,50
718	85	99,61	99,65	99,67
760	90	99,83	99,84	99,76
802	95	99,96	99,98	99,80
844	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 342:
PRINTING, PUBLISHING AND ALLIED INDUSTRIES 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 351 TO 353:
CHEMICALS AND CHEMICAL, PETROLEUM, COAL, RUBBER AND PLASTIC PRODUCTS 1971 72

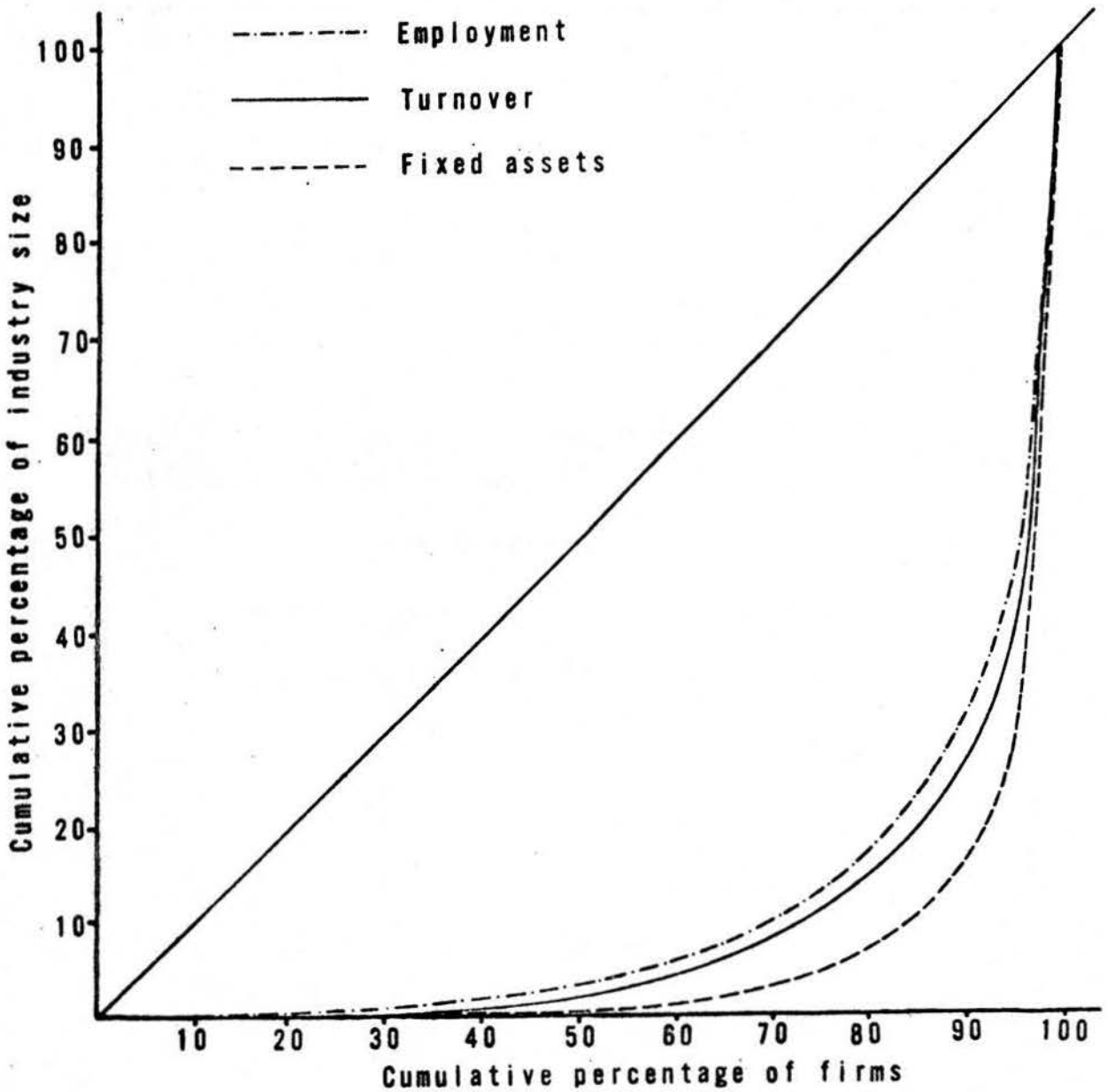


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

351 MANUFACTURE OF INDUSTRIAL CHEMICALS 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
7	5	59,26	54,58	68,55
13	10	72,64	67,05	81,09
19	15	79,50	76,17	89,23
25	20	84,94	82,15	94,19
31	25	88,66	86,56	95,35
37	30	91,30	89,64	96,57
44	35	93,88	92,18	97,71
50	40	95,60	93,90	98,50
56	45	96,87	95,00	99,00
62	50	97,80	96,27	99,33
68	55	98,43	97,12	99,55
74	60	98,94	97,77	99,68
80	65	99,34	98,32	99,77
87	70	99,63	98,86	99,83
93	75	99,77	99,22	99,86
99	80	99,86	99,46	99,88
105	85	99,92	99,63	99,90
111	90	99,97	99,75	99,91
117	95	100,00	99,84	99,93
123	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 351:
INDUSTRIAL CHEMICALS 1971/72

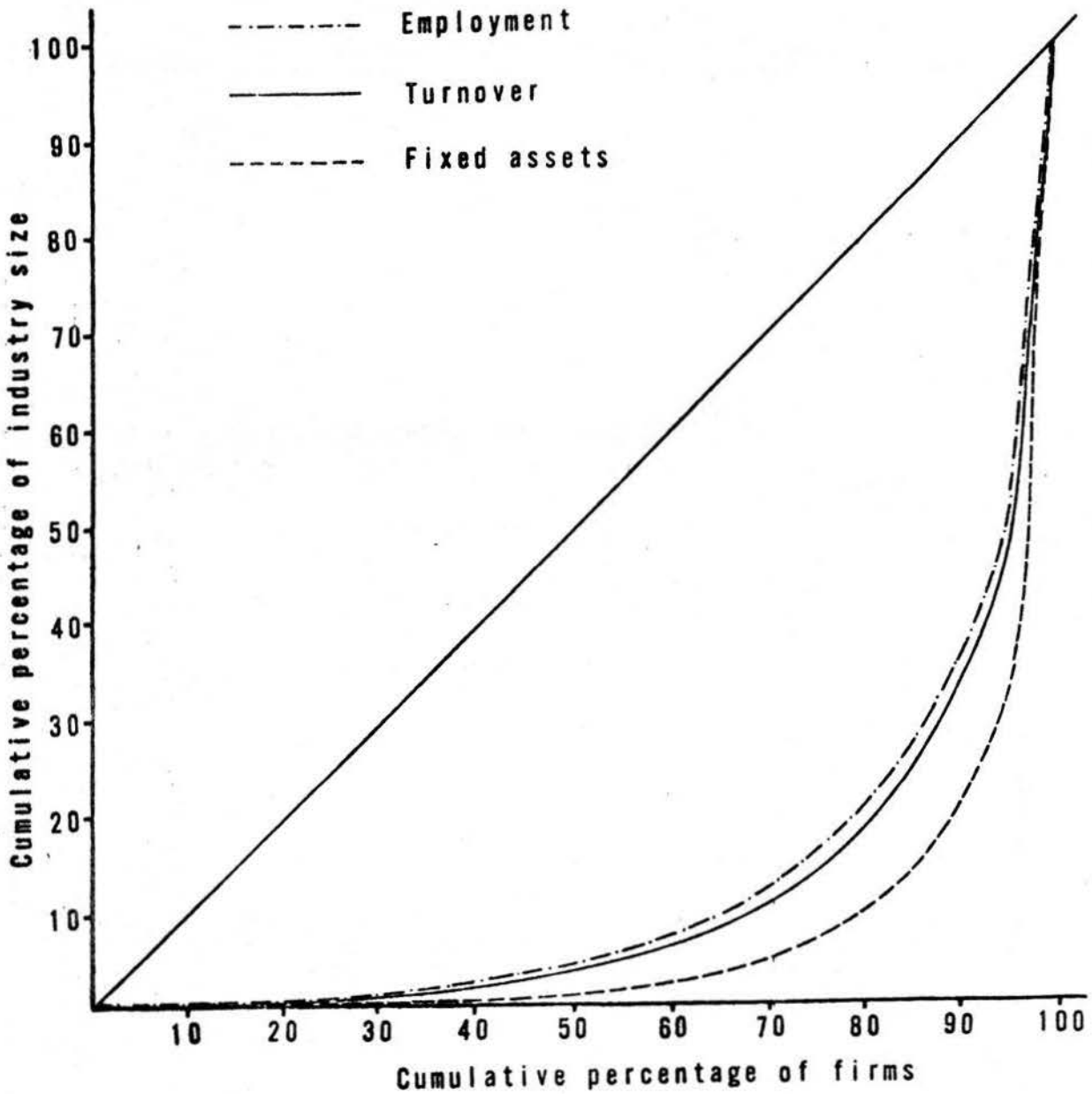


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

352 MANUFACTURE OF OTHER CHEMICAL PRODUCTS 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
18	5	51,69	51,73	68,40
36	10	65,92	64,16	79,47
54	15	75,30	73,23	86,48
71	20	81,67	79,42	90,71
89	25	86,54	84,29	93,46
107	30	89,87	87,88	95,34
124	35	92,14	90,62	96,52
142	40	93,86	92,52	97,54
160	45	95,21	94,16	98,21
177	50	96,27	95,34	98,71
195	55	97,19	96,36	99,09
213	60	97,93	97,18	99,39
231	65	98,48	97,87	99,59
248	70	98,94	98,43	99,74
266	75	99,28	98,94	99,87
284	80	99,54	99,35	99,96
301	85	99,73	99,66	99,99
319	90	99,85	99,88	100,00
337	95	99,92	99,99	100,00
354	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 352:
OTHER CHEMICAL PRODUCTS 1971/72

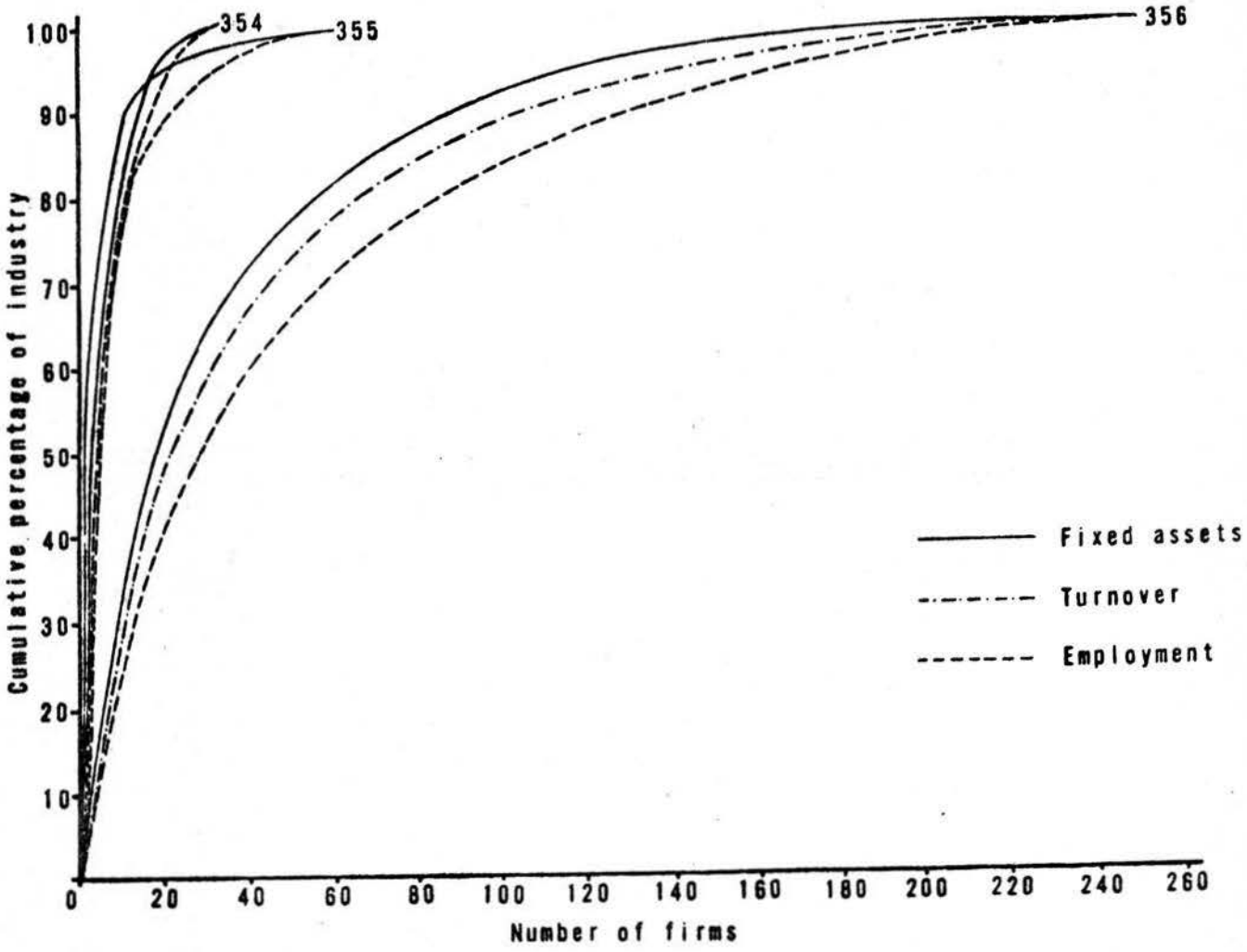


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

353 PETROLEUM REFINERIES 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
3	13	76,72	74,65	81,70
6	26	93,35	90,02	98,75
9	39	97,56	96,19	99,61
12	52	99,51	98,22	99,86
15	65	99,81	99,02	99,95
18	78	99,93	99,51	99,98
21	91	99,99	99,87	100,00
23	100	100,00	100,00	100,00

CONCENTRATION CURVES FOR INDUSTRIES NUMBER 354 TO 356:
CHEMICALS AND CHEMICAL.PETROLEUM.COAL.RUBBER AND PLASTIC PRODUCTS 1971/72



CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

354 MANUFACTURE OF MISCELLANEOUS PRODUCTS OF PETROLEUM AND COAL. 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
3	10	40,68	43,61	41,93
6	20	66,66	64,83	65,73
9	30	82,92	77,88	81,91
12	40	90,13	83,31	88,41
15	50	93,56	87,79	93,04
18	60	95,88	91,88	96,00
21	70	97,44	94,69	97,91
24	80	98,62	96,74	99,00
27	90	99,57	98,66	99,97
30	100	100,00	100,00	100,00

CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

355 MANUFACTURE OF RUBBER PRODUCTS 1971-72.

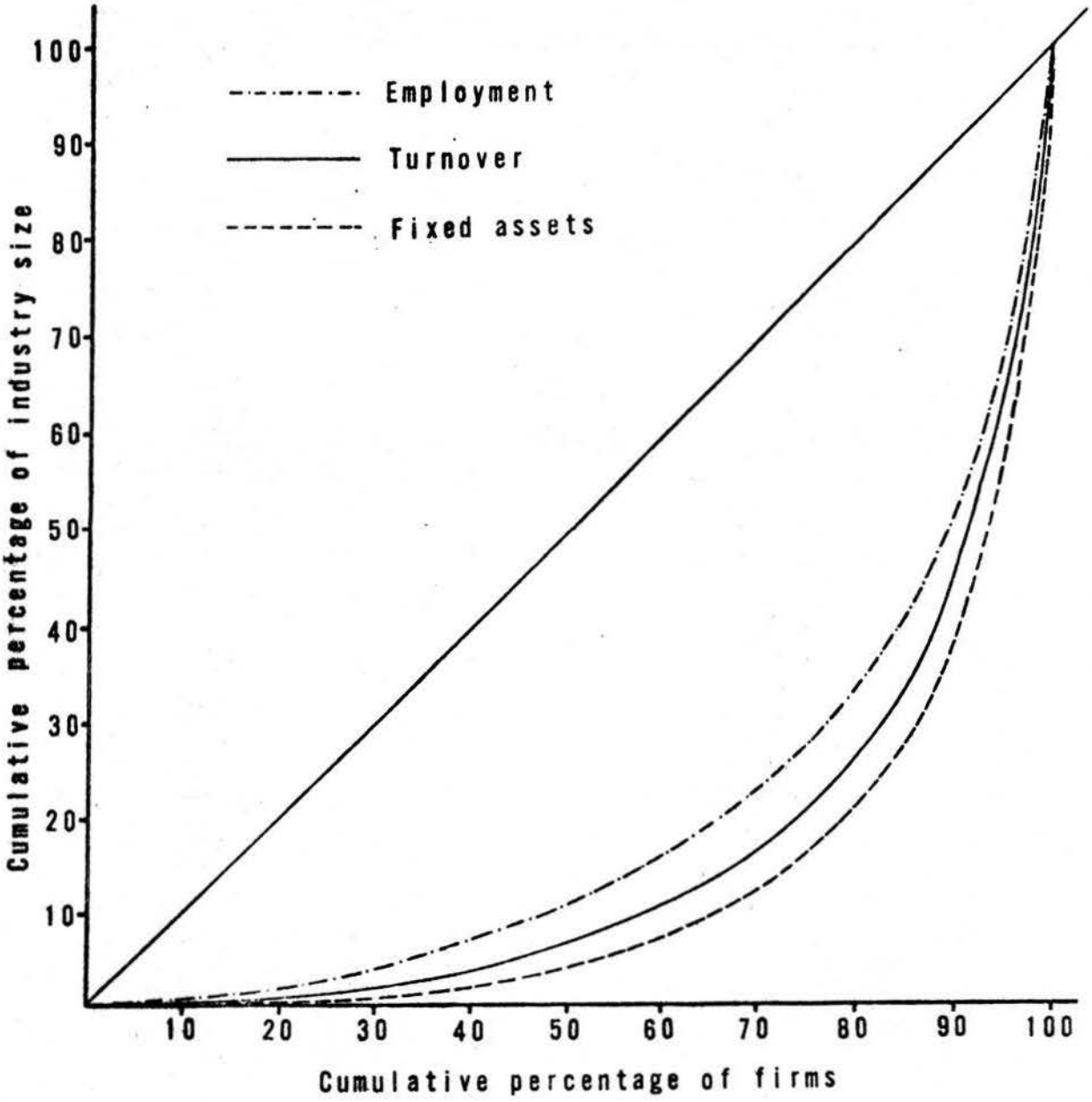
NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
6	10	82,03	70,39	77,98
12	20	89,62	83,37	90,31
18	30	93,49	88,81	94,93
24	40	95,25	92,69	97,00
30	50	96,97	95,61	98,31
36	60	98,04	97,48	98,95
42	70	98,70	98,45	99,38
48	80	99,18	99,17	99,62
54	90	99,44	99,67	99,72
60	98	99,84	99,87	99,76
61	100	100,00	100,00	100,00

CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

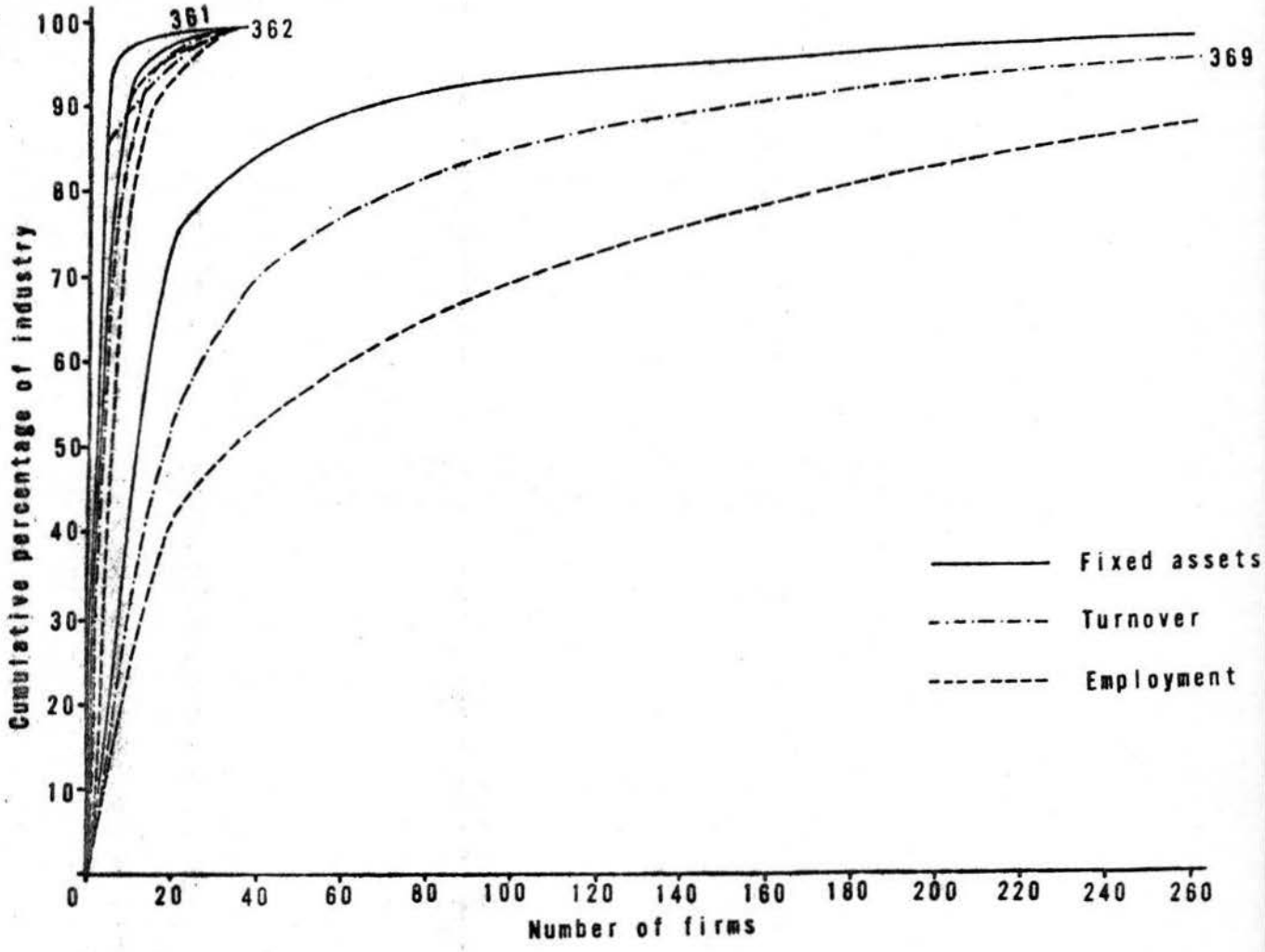
356 MANUFACTURE OF PLASTIC PRODUCTS NOT ELSEWHERE CLASSIFIED 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
13	5	37,20	32,19	42,81
25	10	55,11	47,62	60,40
38	15	66,29	59,00	71,81
50	20	73,53	66,33	78,51
62	25	78,94	72,00	83,41
75	30	83,36	76,82	87,48
87	35	86,66	80,59	90,34
100	40	89,43	83,99	92,47
112	45	91,42	86,55	94,14
124	50	92,92	89,02	95,50
137	55	94,56	91,12	96,65
149	60	95,78	92,87	97,55
162	65	96,93	94,59	98,29
174	70	97,78	95,92	98,80
186	75	98,45	97,03	99,20
199	80	99,01	98,04	99,50
211	85	99,37	98,76	99,71
224	90	99,72	99,34	99,88
236	95	99,91	99,81	99,97
248	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 356:
PLASTIC PRODUCTS 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 361 TO 369:
NON-METTALIC PRODUCTS EXCEPT PRODUCTS OF PETROLEUM AND COAL 1971/72



CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

361 MANUFACTURE OF POTTERY, CHINA AND EARTHENWARE 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
3	8	44,87	45,75	51,36
6	16	77,70	70,10	82,81
9	24	89,15	81,12	92,79
12	32	92,19	85,72	94,76
15	41	94,13	89,76	96,86
18	49	96,32	92,97	97,79
21	57	97,57	95,22	98,44
24	65	98,54	97,13	98,94
27	73	99,17	98,26	99,35
30	81	99,66	99,02	99,73
33	89	99,90	99,46	99,84
36	97	99,99	99,95	99,98
37	100	100,00	100,00	100,00

CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

362 MANUFACTURE OF GLASS AND GLASS PRODUCTS 1971-72

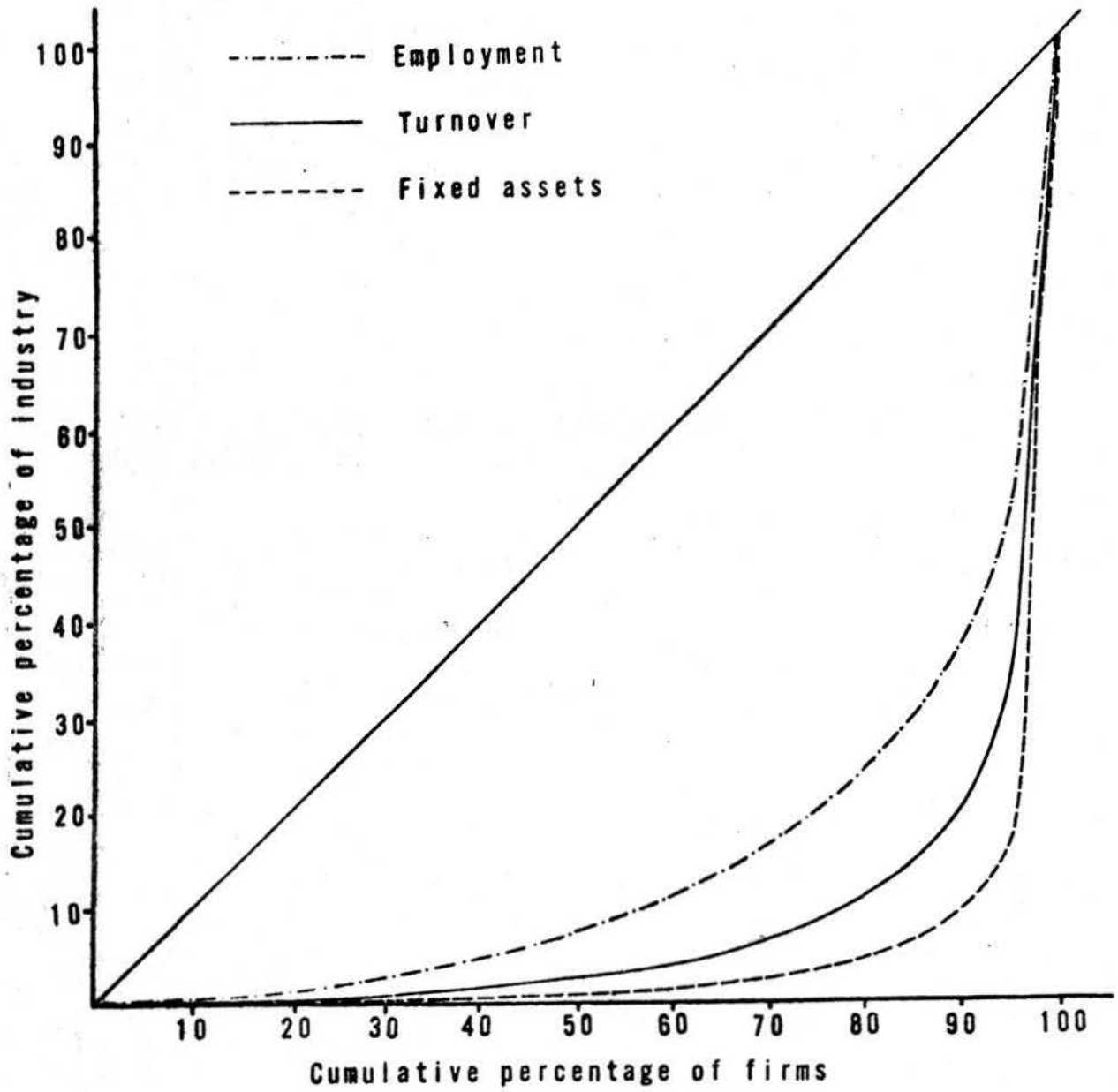
NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
3	8	77,16	77,87	77,16
6	15	89,51	89,20	94,13
9	23	92,08	91,94	96,88
12	31	93,51	94,00	98,23
15	38	94,40	95,29	98,76
18	46	96,01	96,33	99,02
21	54	96,86	96,94	99,15
24	62	97,44	97,50	99,23
27	69	97,82	98,00	99,31
30	77	98,06	98,32	99,36
33	85	98,21	98,51	99,39
36	92	99,26	98,61	99,41
38	100	100,00	100,00	100,00

CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

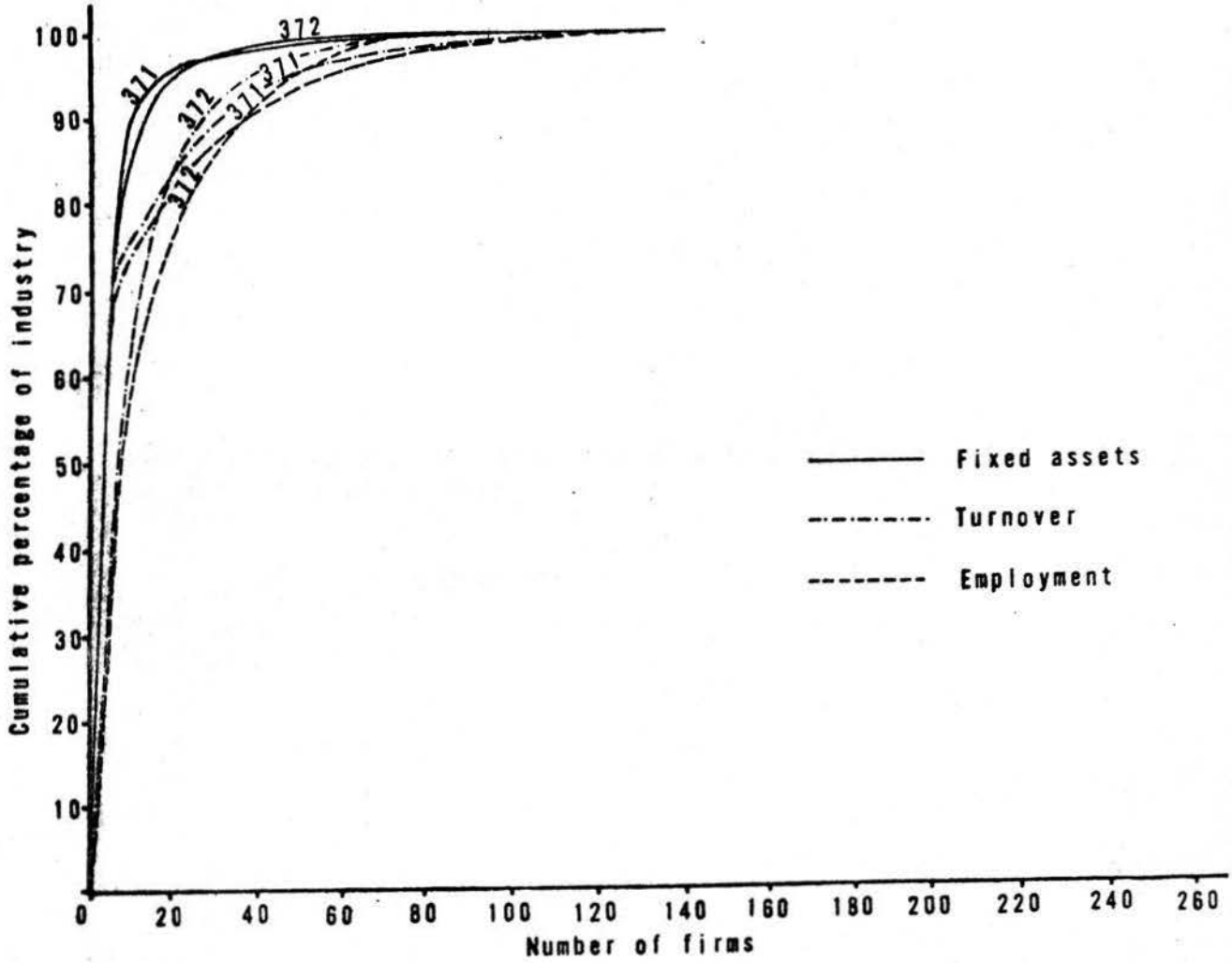
369 MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
34	5	67,40	50,61	83,63
67	10	80,43	62,43	90,93
100	15	85,79	70,03	93,78
134	20	89,21	75,61	95,46
167	25	91,60	79,80	96,52
200	30	93,43	83,18	97,23
234	35	94,84	86,06	97,76
267	40	95,85	88,44	98,16
300	45	96,64	90,50	98,50
333	50	97,32	92,29	98,77
367	55	97,90	93,82	99,00
400	60	98,36	95,07	99,19
433	65	98,72	96,14	99,34
467	70	99,04	97,12	99,46
500	75	99,26	97,90	99,55
533	80	99,43	98,53	99,62
567	85	99,55	99,05	99,67
600	90	99,63	99,43	99,69
633	95	99,67	99,69	99,70
666	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 369:
OTHER NON-METALLIC PRODUCTS 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 371 AND 372: BASIC METAL INDUSTRIES 1971/72



CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

371 IRON AND STEEL BASIC INDUSTRIES 1971-72.

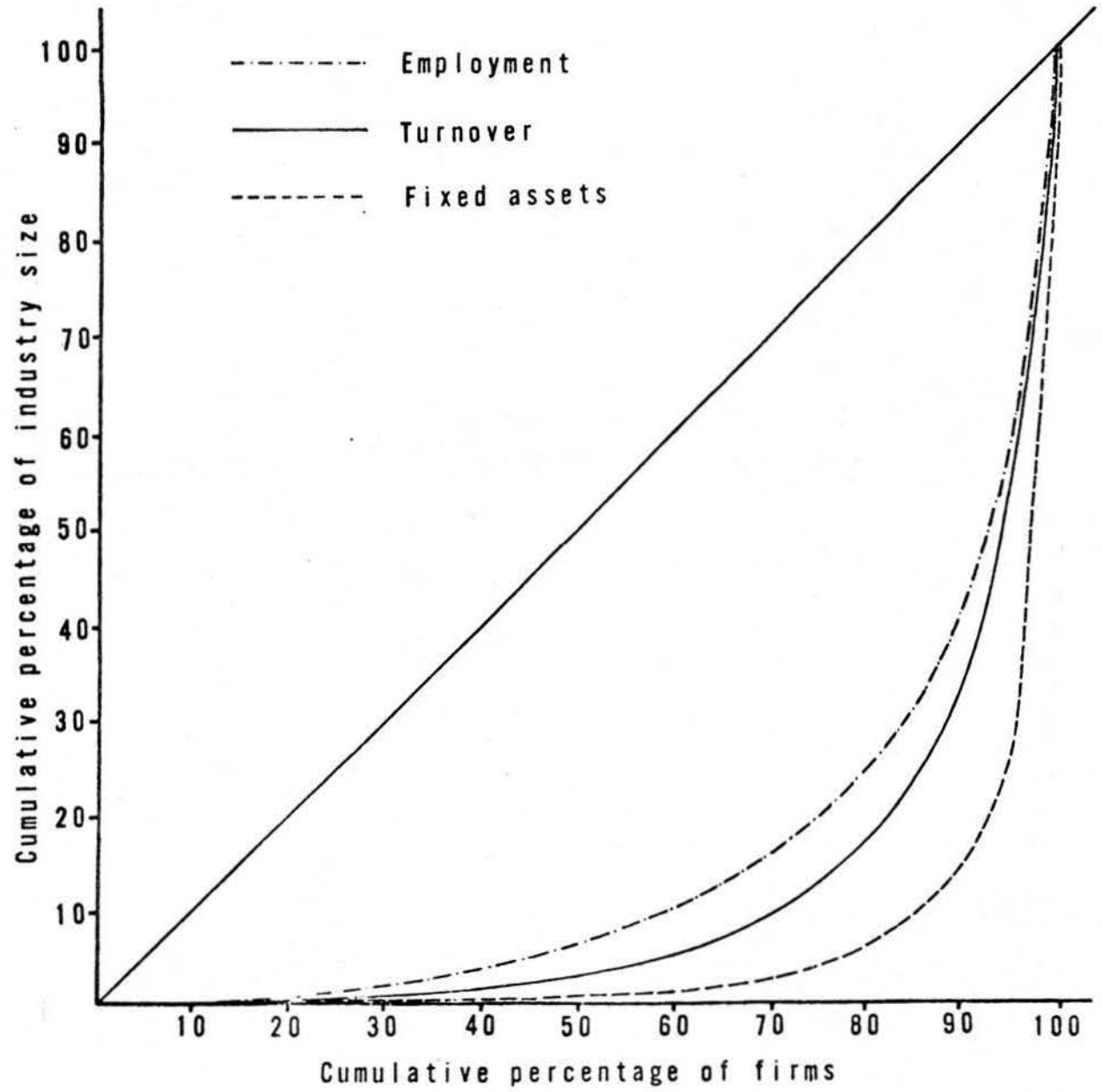
NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
7	5	71,28	70,98	92,36
14	10	78,85	78,34	95,13
21	15	85,46	83,94	96,45
27	20	88,94	87,10	97,35
34	25	92,05	89,74	98,04
41	30	94,22	91,74	98,55
47	35	95,46	93,22	98,93
54	40	96,52	94,58	99,17
61	45	97,29	95,73	99,36
67	50	97,86	96,58	99,49
74	55	98,37	97,24	99,61
81	60	98,78	97,87	99,70
88	65	99,08	98,36	99,78
94	70	99,32	98,74	99,83
101	75	99,53	99,13	99,88
108	80	99,70	99,42	99,91
114	85	99,81	99,61	99,93
121	90	99,91	99,82	99,94
128	95	99,97	99,99	99,95
134	100	100,00	100,00	100,00

CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

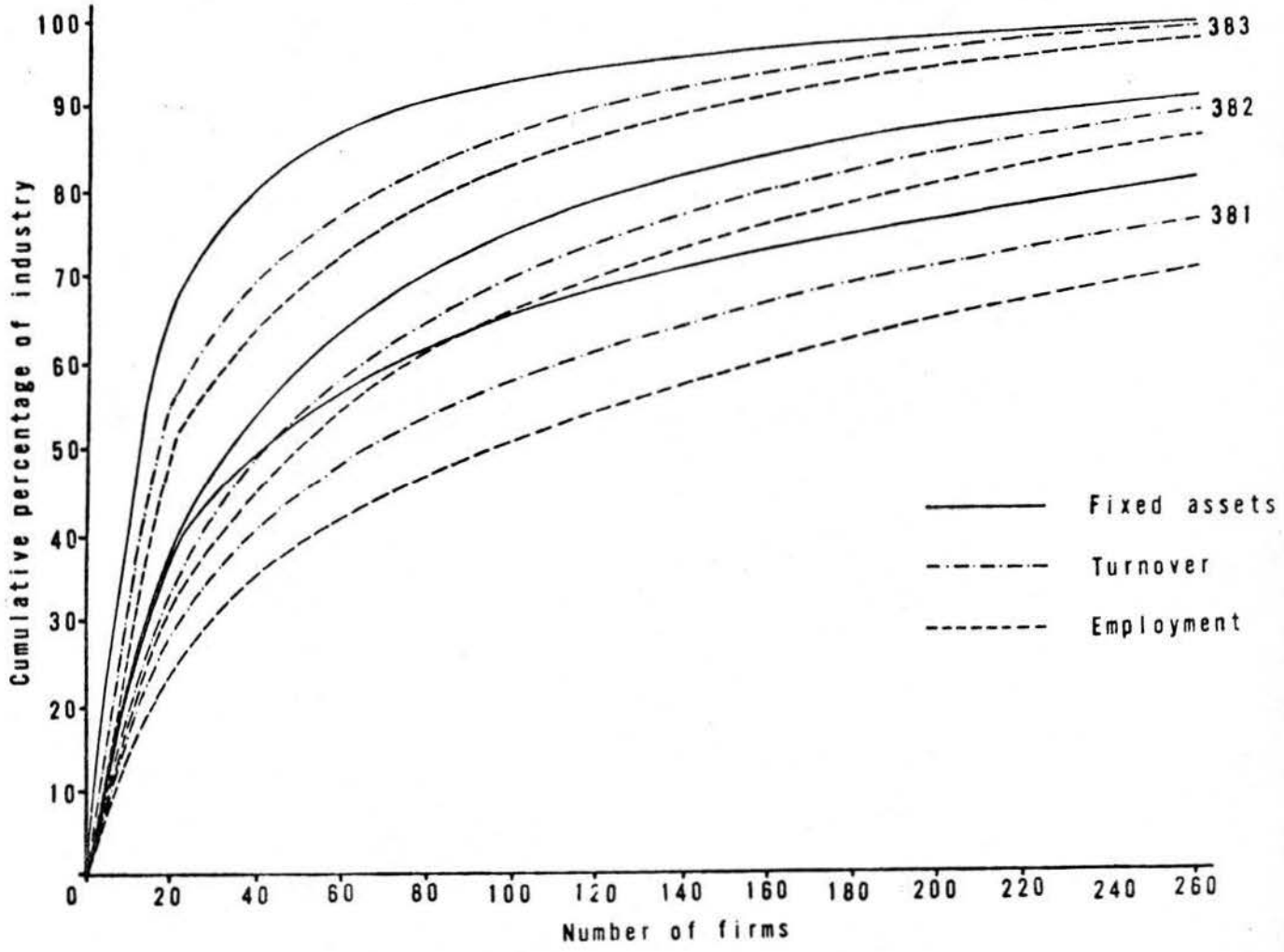
372 NON-FERROUS METAL BASIC INDUSTRIES 1971-72,

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
5	5	46,73	43,46	71,79
9	10	63,06	58,28	84,60
14	15	75,87	69,10	90,47
18	20	82,77	75,39	94,36
22	25	87,02	80,22	96,19
27	30	90,84	84,60	97,61
31	35	92,95	87,41	98,26
36	40	95,03	90,30	98,79
40	45	96,07	92,17	99,06
44	50	96,82	93,60	99,24
49	55	97,60	95,09	99,44
53	60	98,13	96,06	99,58
58	65	98,67	97,14	99,73
62	70	99,01	97,85	99,82
66	75	99,30	98,44	99,89
71	80	99,59	99,09	99,95
75	85	99,77	99,44	99,97
80	90	99,90	99,74	99,99
84	95	99,98	99,90	100,00
88	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 372:
NON-FERROUS METAL BASIC INDUSTRIES 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 381 TO 383:
FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT 1971/72

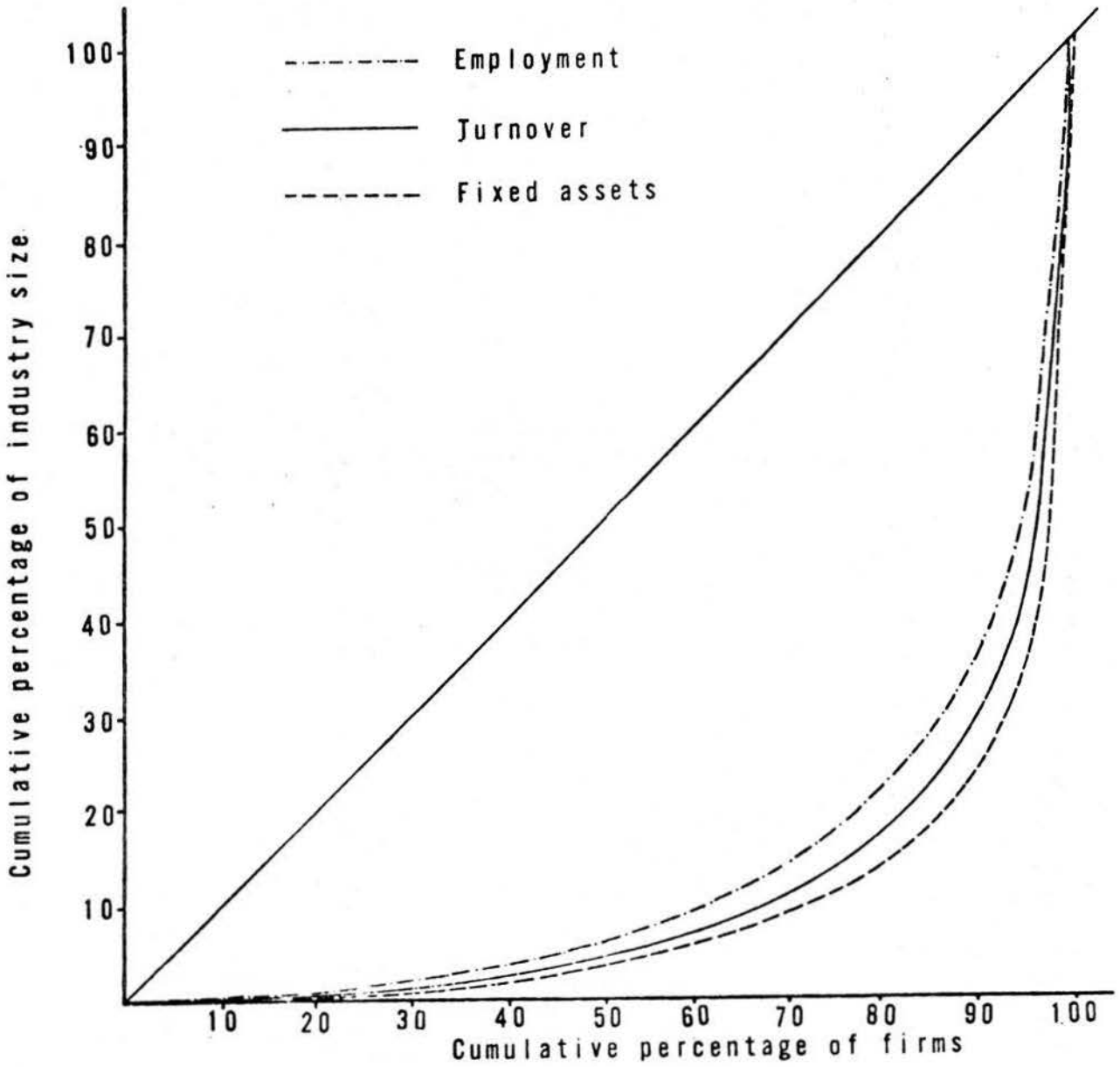


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

381 MANUFACTURE OF FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
95	5	57,24	50,22	64,87
189	10	69,71	63,60	75,78
284	15	77,12	71,84	81,75
378	20	82,39	77,52	85,63
473	25	86,27	82,01	88,55
567	30	89,10	85,51	90,80
662	35	91,35	88,29	92,63
756	40	93,10	90,50	94,14
850	45	94,54	92,33	95,38
945	50	95,76	93,86	96,40
1039	55	96,76	95,12	97,25
1134	60	97,60	96,19	97,95
1228	65	98,26	97,07	98,51
1323	70	98,79	97,81	98,98
1417	75	99,21	98,43	99,34
1512	80	99,53	98,95	99,63
1606	85	99,76	99,38	99,84
1701	90	99,93	99,71	99,98
1795	95	99,99	99,95	100,00
1889	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 381:
FABRICATED METAL PRODUCTS EXCEPT MACHINERY AND EQUIPMENT 1971/72

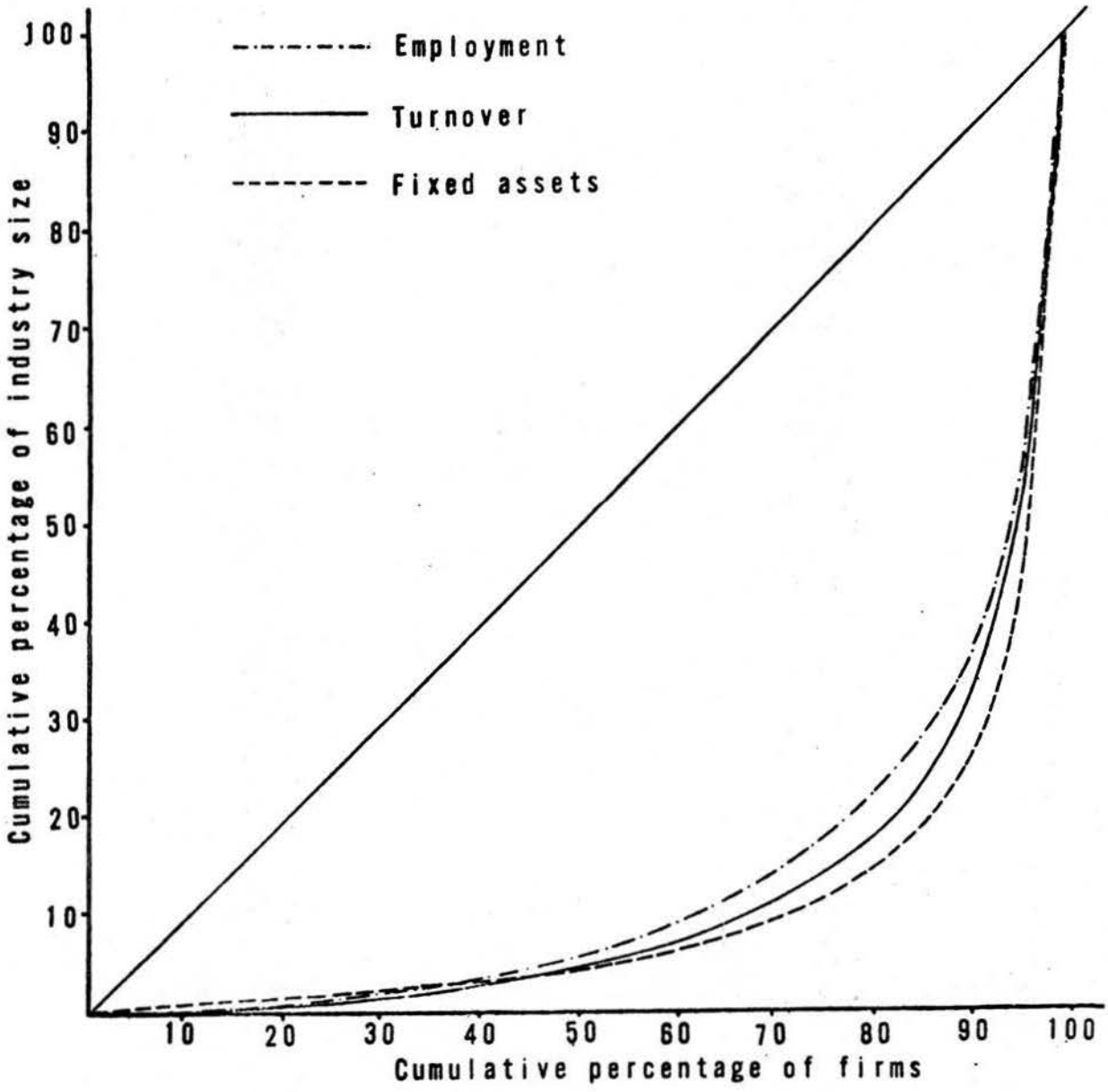


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

382 MANUFACTURE OF MACHINERY, EXCEPT ELECTRICAL 1971-72

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
44	5	51,53	47,62	56,87
88	10	67,10	63,51	73,04
132	15	75,96	71,99	80,78
176	20	81,70	77,84	85,24
220	25	85,69	82,37	88,19
264	30	88,71	85,82	90,41
307	35	91,03	88,53	92,07
351	40	92,91	90,83	93,44
395	45	94,37	92,71	94,53
439	50	95,56	94,17	95,38
483	55	96,54	95,35	96,04
527	60	97,30	96,31	96,58
571	65	97,92	97,11	97,04
614	70	98,42	97,80	97,41
658	75	98,81	98,30	97,72
702	80	99,12	98,83	97,94
746	85	99,36	99,19	98,10
790	90	99,53	99,48	98,20
834	95	99,64	99,66	99,00
877	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 382:
MACHINERY, EXCEPT ELECTRICAL 1971/72

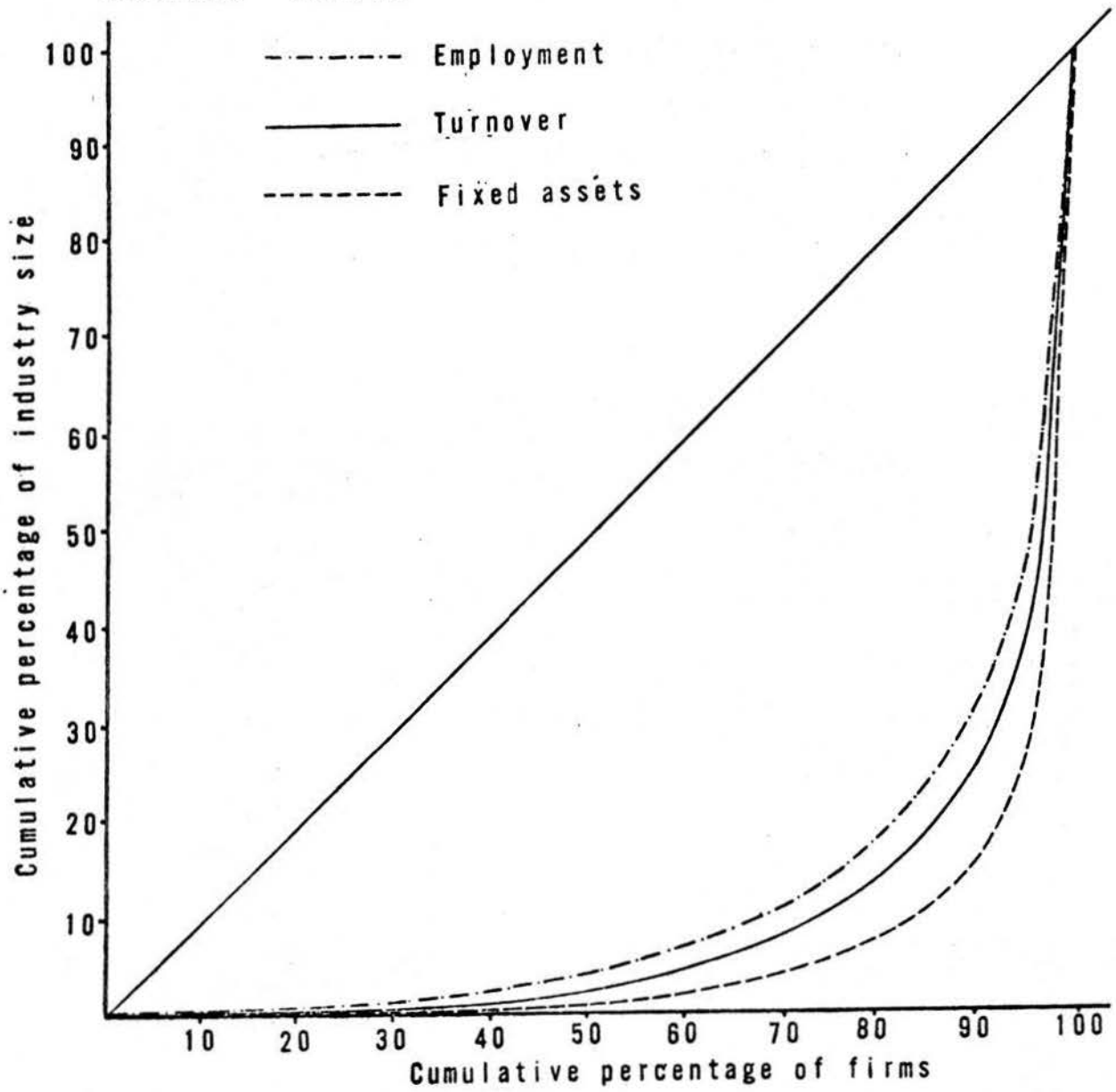


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

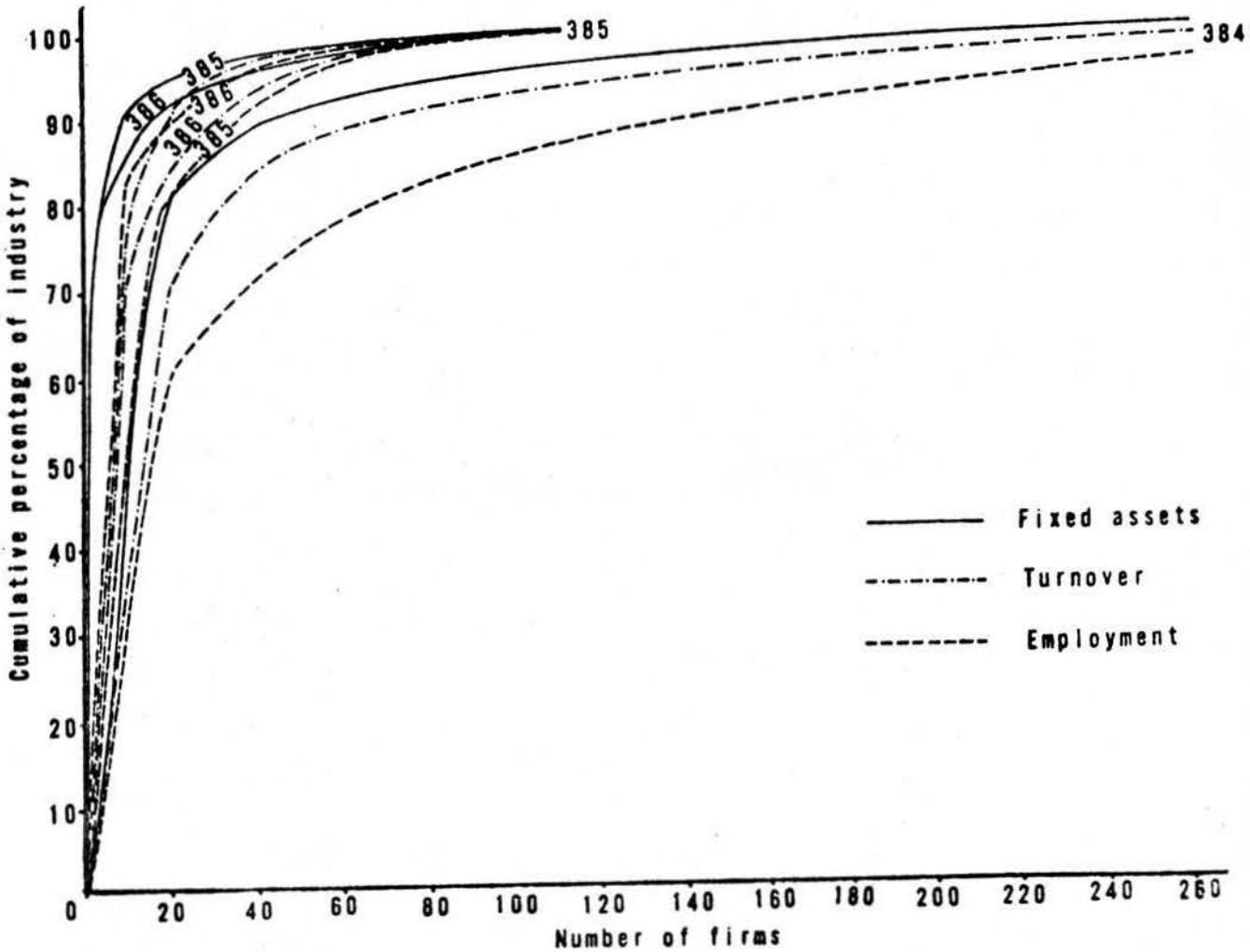
383 MANUFACTURE OF ELECTRICAL MACHINERY, APPARATUS, APPLIANCES AND SUPPLIES 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
23	5	59,04	53,77	70,31
46	10	72,84	66,91	83,59
69	15	80,68	75,31	88,83
92	20	85,67	81,29	91,88
115	25	89,26	85,50	93,87
138	30	91,80	88,69	95,22
160	35	93,65	90,99	96,28
183	40	95,17	92,82	97,15
206	45	96,38	94,31	97,78
229	50	97,32	95,55	98,22
252	55	98,06	96,52	98,59
275	60	98,60	97,28	98,87
298	65	99,02	97,94	99,09
320	70	99,35	98,46	99,24
343	75	99,63	98,90	99,36
366	80	99,83	99,25	99,47
389	85	99,97	99,55	99,54
412	90	99,99	99,77	99,60
435	95	100,00	99,92	99,70
457	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 383:
ELECTRICAL MACHINERY. APPARATUS. APPLIANCES AND SUPPLIES 1971/72



CONCENTRATION CURVES FOR INDUSTRIES NUMBER 384 TO 386:
FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT 1971/72

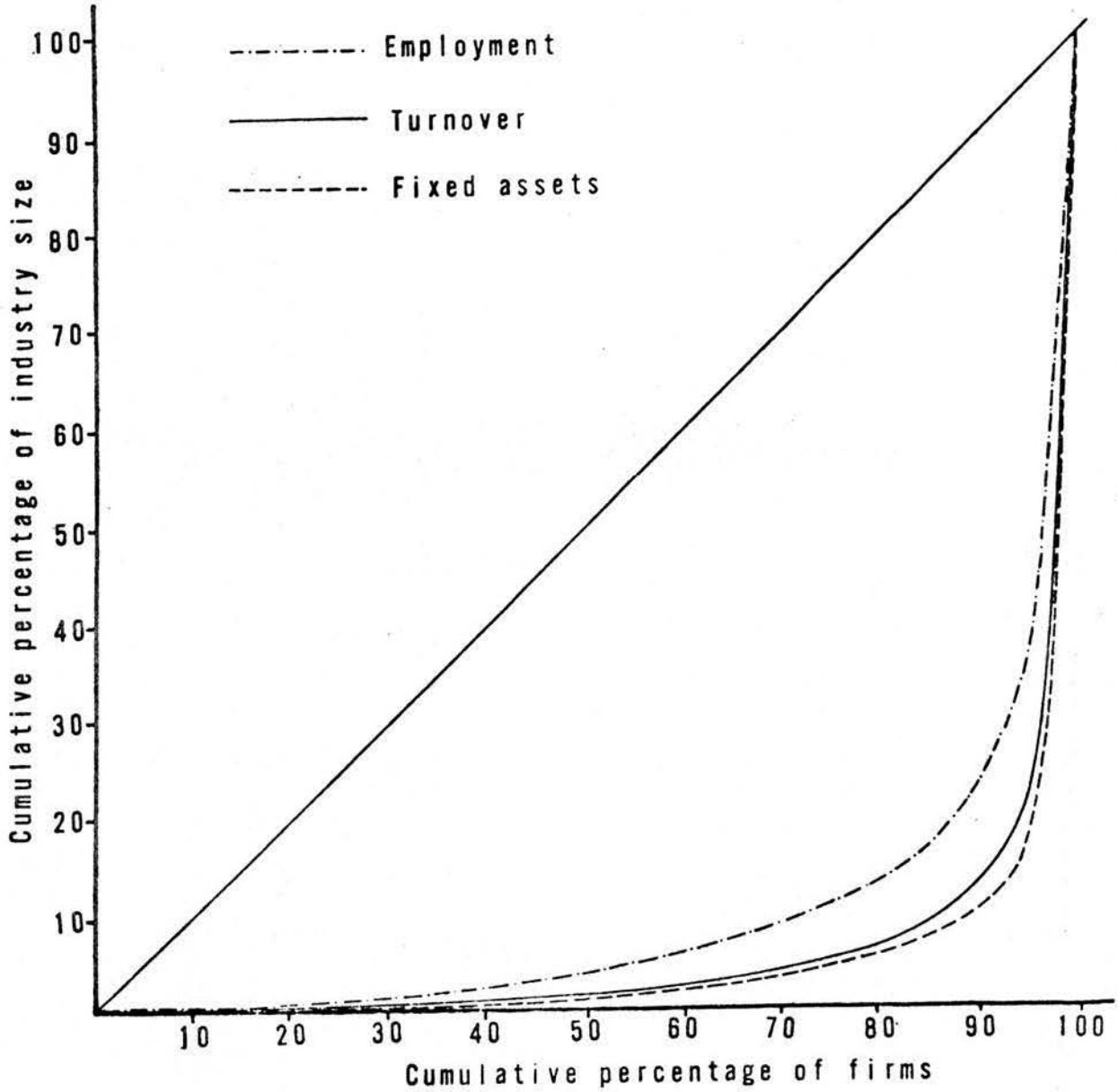


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

384 MANUFACTURE OF MOTOR VEHICLES, PARTS AND ACCESSORIES 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
26	5	79,00	65,30	84,78
52	10	86,50	76,65	89,94
79	15	91,50	83,08	92,47
105	20	92,66	86,39	94,15
133	25	94,05	88,86	95,28
159	30	95,12	90,71	96,14
185	35	96,12	92,31	98,85
211	40	96,14	93,60	97,43
239	45	97,67	94,69	97,93
265	50	98,54	95,63	98,33
292	55	98,98	96,47	98,69
317	60	99,01	97,20	98,99
345	65	99,06	97,83	99,24
371	70	99,10	98,35	99,46
397	75	99,34	98,79	99,63
424	80	99,51	99,14	99,77
450	85	99,63	99,44	99,87
476	90	99,89	99,67	99,84
503	95	99,96	99,84	99,98
529	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 384:
MOTOR VEHICLES PARTS AND ACCESSORIES 1971/72

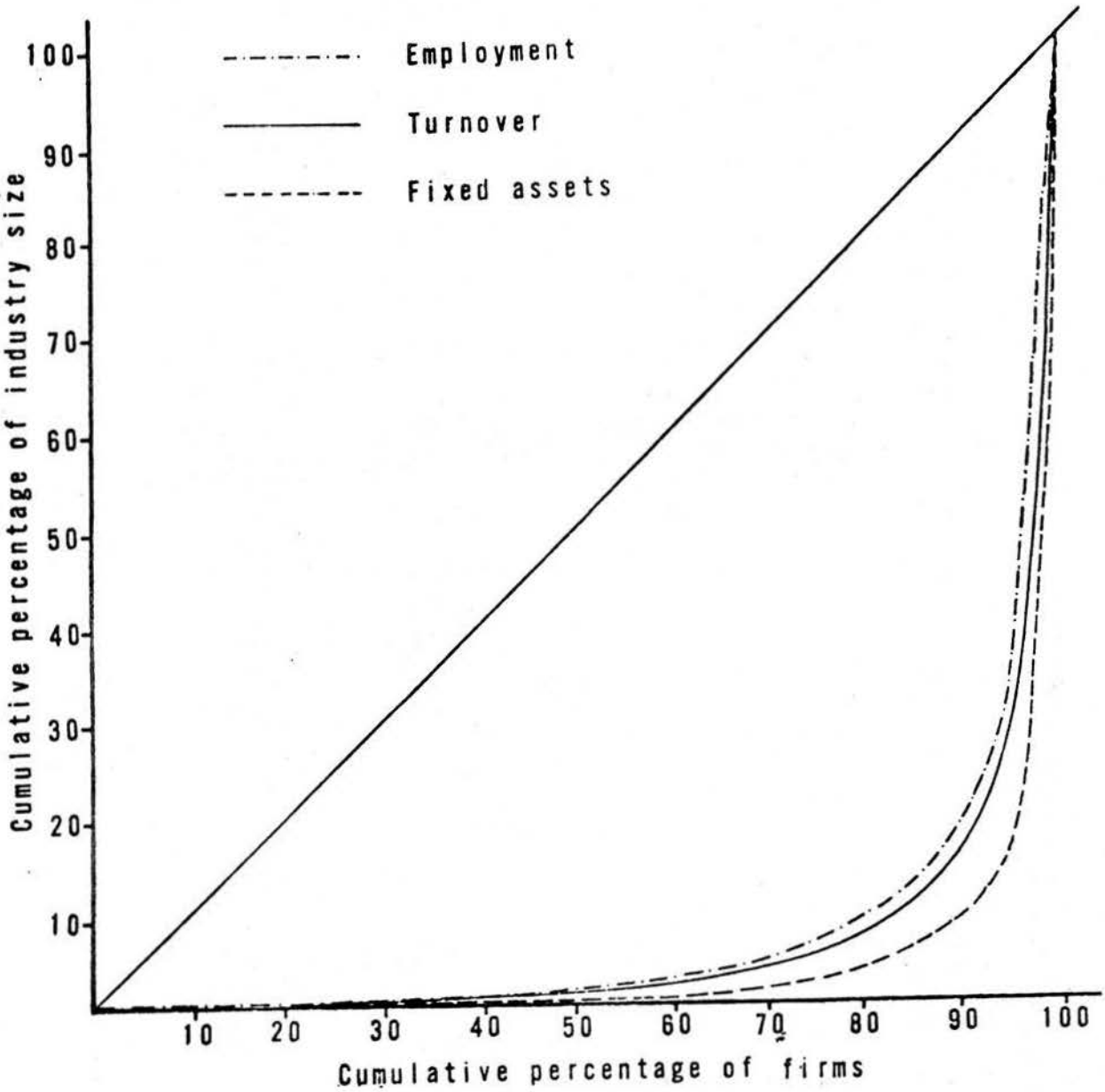


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

385 MANUFACTURE OF TRANSPORT EQUIPMENT, EXCEPT MOTOR VEHICLES, PARTS AND ACCESSORIES 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
6	5	69,32	68,86	83,92
12	10	83,48	81,62	91,45
17	15	88,32	87,76	94,22
23	20	92,65	91,08	96,56
29	25	94,95	93,64	97,86
34	30	96,27	95,08	98,37
40	35	96,99	96,28	98,83
46	40	97,79	97,15	99,15
51	45	98,36	97,71	99,37
57	50	98,69	98,24	99,57
63	55	98,99	98,65	99,72
68	60	99,10	98,91	99,81
74	65	99,30	99,16	99,90
80	70	99,54	99,31	99,95
85	75	99,63	99,43	99,98
91	80	99,71	99,58	99,99
97	85	99,80	99,67	100,00
102	90	99,87	99,73	100,00
108	95	99,95	99,77	100,00
113	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 385:
TRANSPORT EQUIPMENT, EXCEPT MOTOR VEHICLES 1971/72

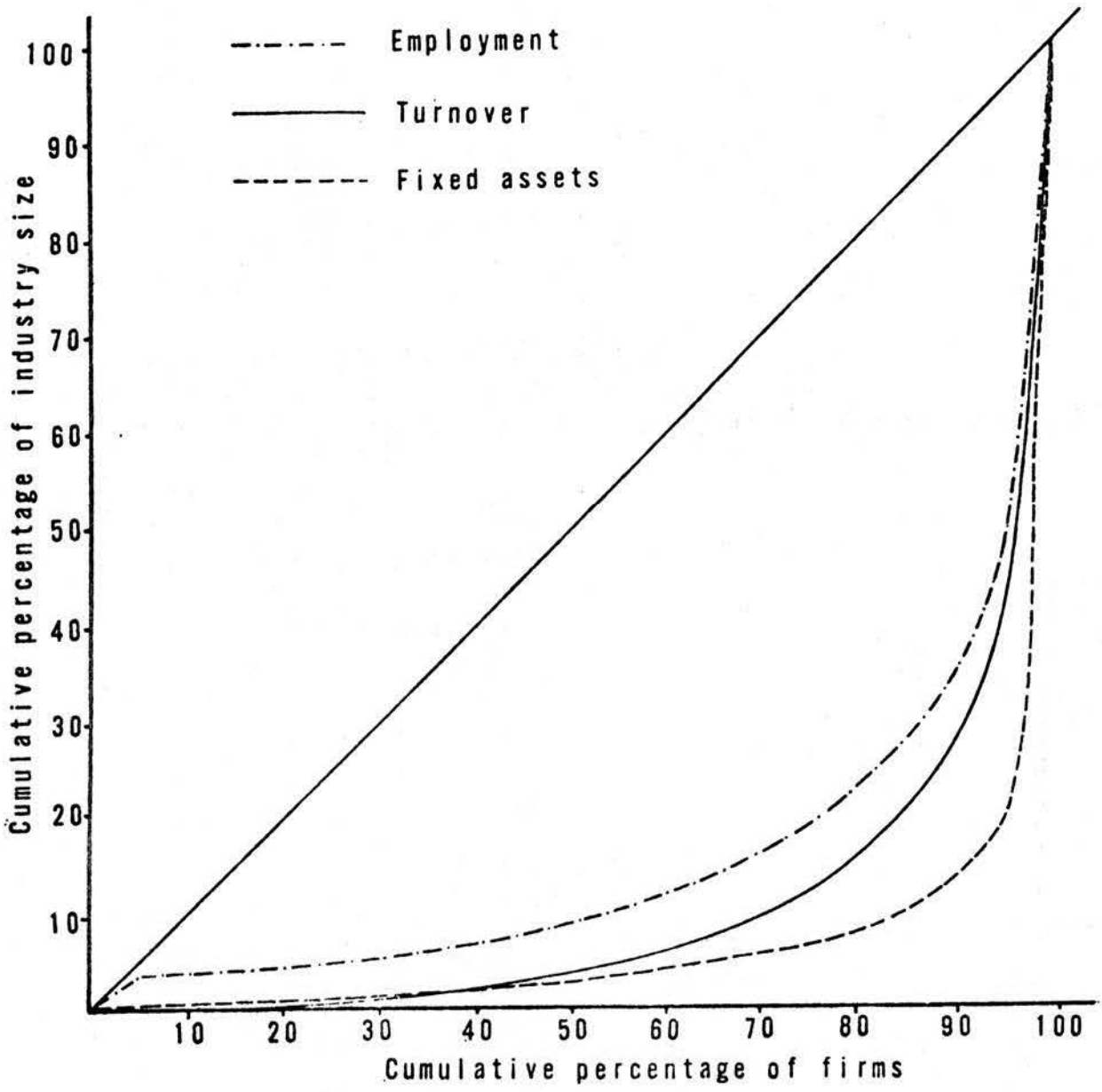


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

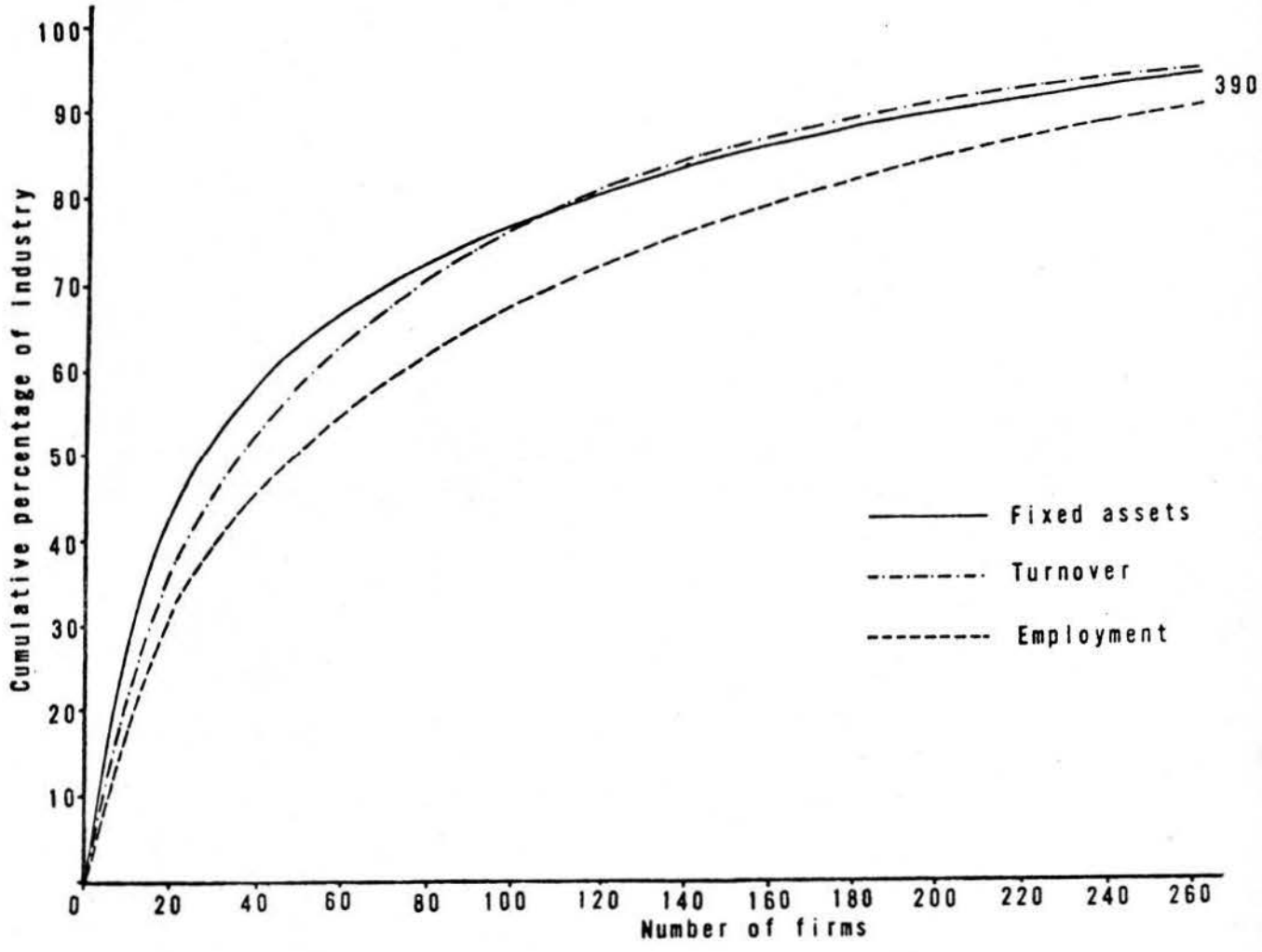
386 MANUFACTURE OF PROFESSIONAL AND SCIENTIFIC AND MEASURING AND CONTROLLING EQUIPMENT NOT ELSE-WHERE CLASSIFIED, AND OF PHOTOGRAPHIC AND OPTICAL GOODS 1971-72.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
5	5	57,77	52,43	80,59
9	10	71,04	64,67	86,43
14	15	78,56	71,59	89,79
18	20	82,96	76,22	91,63
23	25	87,28	80,59	93,18
28	30	90,05	83,19	94,28
32	35	91,68	85,57	94,99
37	40	93,35	87,47	95,80
42	45	94,87	89,14	96,48
46	50	95,87	90,32	96,95
51	55	96,95	91,64	97,44
56	60	97,89	92,67	97,84
61	65	98,58	93,58	98,20
65	70	99,27	94,19	98,40
70	75	99,33	94,77	98,59
75	80	99,60	95,20	98,74
79	85	99,77	95,43	98,83
84	90	99,91	95,76	98,89
89	95	99,99	95,86	99,95
93	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 386:
PROFESSIONAL AND SCIENTIFIC MEASURING AND
CONTROLLING EQUIPMENT AND OF PHOTOGRAPHIC AND OPTICAL GOODS 1971/72



CONCENTRATION CURVES FOR INDUSTRY NUMBER 390:
OTHER MANUFACTURING INDUSTRIES 1971/72

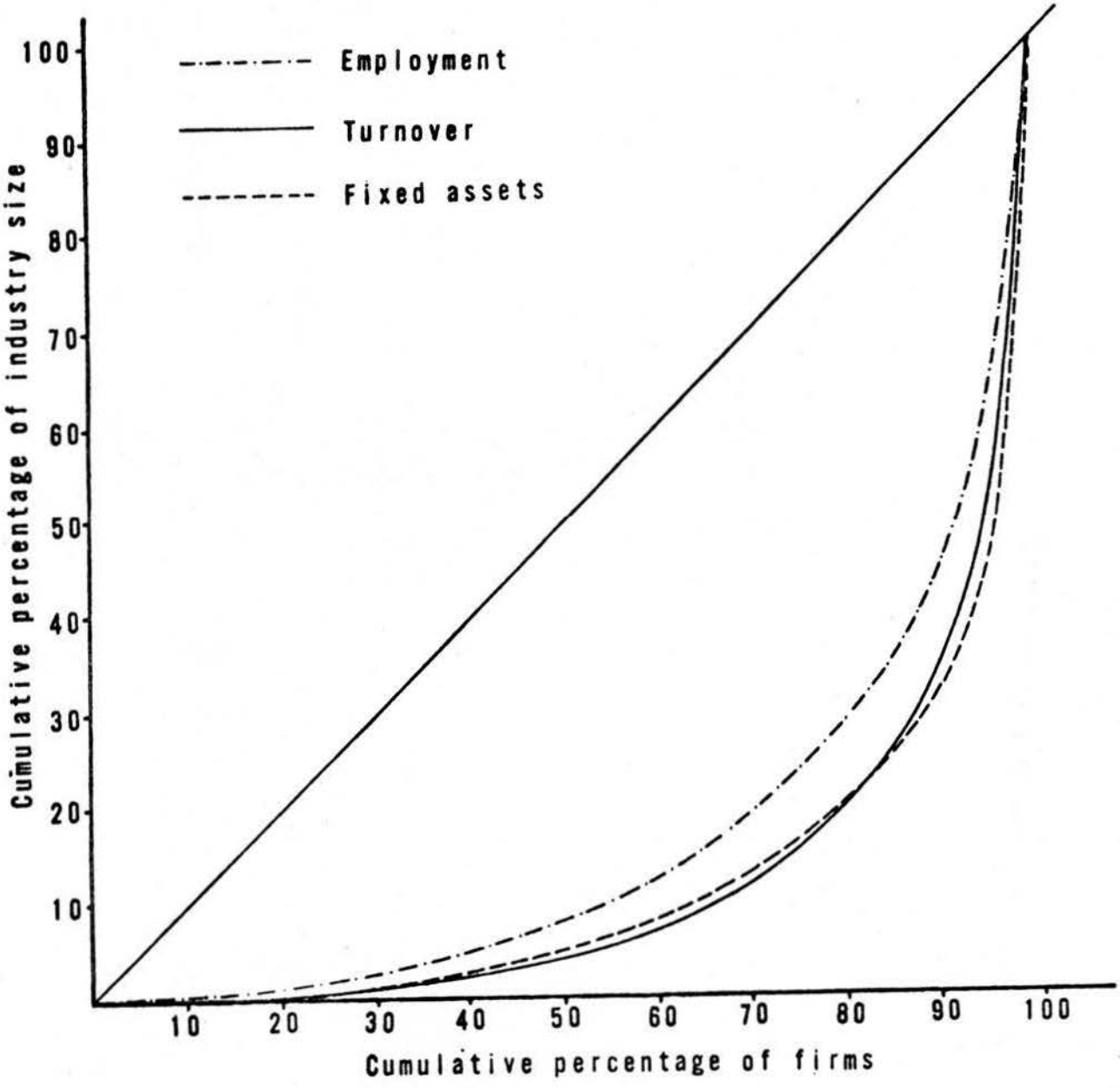


CUMULATIVE CONCENTRATION OF ECONOMIC POWER IN THE SOUTH AFRICAN MANUFACTURING INDUSTRY ON A MAJOR GROUP BASIS 1971-72

390 OTHER MANUFACTURING INDUSTRIES.

NUMBER OF FIRMS	CUMULATIVE PERCENTAGE OF FIRMS	CUMULATIVE PERCENTAGE OF TURN-OVER	CUMULATIVE PERCENTAGE OF EMPLOY-MENT	CUMULATIVE PERCENTAGE OF FIXED ASSETS
29	5	46,07	39,95	52,39
57	10	62,34	54,37	66,88
85	15	72,74	64,14	74,28
113	20	80,00	70,84	79,58
141	25	84,75	76,27	83,50
169	30	88,19	80,67	86,66
198	35	90,81	84,36	89,32
226	40	92,76	87,24	91,45
254	45	94,31	89,64	93,20
282	50	95,53	91,59	94,71
310	55	96,54	93,25	95,96
338	60	97,42	94,69	96,89
366	65	98,12	95,92	97,85
395	70	98,66	97,01	98,95
423	75	99,10	97,85	99,09
451	80	99,46	98,54	99,50
479	85	99,74	99,12	99,81
507	90	99,95	99,63	99,93
535	95	99,99	99,98	99,99
563	100	100,00	100,00	100,00

LORENZ CURVES FOR INDUSTRY NUMBER 390:
OTHER MANUFACTURING INDUSTRIES 1971/72



APPENDIX 5

CONCENTRATION INDICES FOR FIVE-DIGIT MANUFACTURING INDUSTRIES IN SOUTH AFRICA - 1972

This Appendix contains the indices for four variants of the common concentration ratio, each based on three variables, as well as the Horvath comprehensive measure of concentration based on turnover.

Measures:	Variables:
CR_3	Turnover
CR_5	Employment
$CR_{70\%}$	Fixed assets
$CR_{80\%}$	
CCI	

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
	MAJOR DIVISION 3. MANUFACTURING														
31	Manufacture of Food, Beverages and Tobacco														
311	Food manufacturing														
	Slaughtering, preparing and preserving meat														
31110	Abattoirs: slaughtering, dressing and packing and small game for meat	7	.8912	.9699	3	3	.8044	.9515	3	3	.8733	.9870	3	3	.6166
31111	Canned and prepared meats and meat specialities, including meat soups, meat puddings and meat pies	70	.3380	.4596	15	21	.2858	.3961	15	22	.3341	.4672	13	18	.2189
31112	Natural sausage casings; tallow, dripping and lard	4	.9200	1.0000	2	3	.9500	1.0000	3	2	.9499	1.0000	2	2	.6720
	Manufacture of dairy products														
31120	Butter and cheese	50	.2546	.3555	15	20	.2791	.3930	16	22	.2579	.3791	15	21	.1883
31121	Condensed milk and milk powder and other edible milk products, except ice cream, ices, etc.	14	.8184	.9044	2	3	.6763	.8460	4	5	.6374	.8229	4	5	.6469
31122	Ice cream, ices and other frozen milk desserts	39	.5687	.7465	5	7	.5524	.6333	8	12	.6100	.7461	5	7	.3770
	Canning and preserving of fruits and vegetables														
31130	Canned, preserved and dried fruit and vegetable juices; fresh fruit cordials and squashes; jams and jellies	68	.3767	.4588	15	20	.3835	.4785	11	18	.3955	.5028	10	15	.2681

31131 Pickles/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
31131	Pickles and sauces	13	.7533	.8620	3	4	.6853	.8642	4	4	.6770	.8856	4	4	.5356
31132	Dried fruit packing	2	1.0000	1.0000	1	1	1.0000	1.0000	1	1	1.0000	1.0000	1	1	.9958
	Canning, preserving and processing of fish, crustacea and similar foods; manufacture of fish oil and meal														
31140	Canned and preserved fish, fish meal and fish oil, including such processing on factory ships	36	.4814	.5868	8	12	.5398	.6362	7	11	.3977	.5627	8	11	.3303
	Manufacture of vegetable and animal oils and fats, including whale oil														
31150	Crude oil and oilseed cake and meal	5	.9850	1.0000	2	3	.9756	1.0000	2	3	.9813	1.0000	2	2	.7174
31151	Compound cooking fats, margarine and edible oils	13	.5885	.8060	4	5	.5885	.7352	5	7	.5208	.7261	5	6	.4421
31152	Whale oil	1	1.0000	1.0000	1	1	1.0000	1.0000	1	1	1.0000	1.0000	1	1	1.0000
	Grain mill products														
31160	Flour and other grain mill products, including stock dry feeds	310	.2178	.3135	22	33	.2178	.3135	28	45	.3121	.4504	15	22	.1323
31161	Instant breakfast foods	5	.9020	1.0000	2	3	.8492	1.0000	1	2	.9189	1.0000	1	2	.6724
	Manufacture of bakery products														
31170	Bread, cakes and biscuits	475	.1749	.2251	64	107	.1699	.2209	67	112	.2667	.3149	48	87	.1224
31171	Macaroni, vermicelli and spaghetti	4	.9973	1.0000	1	1	.9855	1.0000	1	1	.9962	1.0000	1	1	.9203

Sugar/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
	Sugar factories and refineries														
31180	Manufacture and refining of sugar; golden syrup	18	.4820	.5996	7	10	.3397	.4934	9	11	.3973	.5473	8	10	.3493
	Manufacture of cocoa, chocolate and sugar confectionery														
31190	Chocolates, sugar confectionery and cocoa	46	.5045	.6784	6	7	.4757	.6310	7	8	.5306	.6780	6	8	.3647
31191	Roasted peanuts, other nuts and popcorn	15	.5763	.8196	4	5	.6170	.7745	4	6	.7567	.8884	3	4	.4188
312	Manufacture of food products not elsewhere classified														
31210	Flavouring essences	5	.9578	1.0000	2	2	.8841	1.0000	1	2	.9642	1.0000	2	2	.7570
31211	Vinegar	7	.7360	.9289	3	4	.5970	.8209	4	5	.7021	.9067	3	4	.5347
31212	Coffee roasting, chicory grinding and tea blending and packing	28	.6872	.8335	4	5	.6198	.7573	5	6	.5371	.7163	5	7	.4923
31213	Yeast	5	.8316	1.0000	3	3	.7877	1.0000	3	4	.8146	1.0000	3	3	.6251
31219	Other food products n.e.c. (including tartaric materials, baking powder, jellies, custards and pudding powders, and refined salt, excluding salt produced in conjunction with the operation of salt pans and mines)	58	.3269	.4534	10	13	.2705	.4153	11	14	.6072	.7226	5	8	.2305
	Manufacture of prepared animal feeds														
31220	Balanced animal feeds	41	.4383	.5763	8	11	.3460	.4617	12	15	.5233	.6670	6	9	.2992

31221 Chaff/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
31221	Chaff cutting; compressed fodder; and lucern meal milling	6	.9673	.9976	2	2	.9024	1.0000	1	1	.8670	1.0000	3	3	.7423
31222	Bone-meal and blood-meal	10	.7986	.9593	3	4	.7108	.8916	3	4	.7172	.8674	3	5	.6315
313	Beverage industries														
	Distilling, rectifying and blending spirits; wine industries														
31310	Distilleries and wineries	86	.6442	.7650	4	7	.6682	.7834	4	6	.5047	.5584	15	28	.4497
	Malt liquors and malt														
31330	Breweries, except Bantu beer breweries	3	1.0000	1.0000	1	2	1.0000	1.0000	1	2	1.0000	1.0000	1	2	.8111
31331	Breweries - Bantu beer	12	.8492	.9768	3	3	.6763	.9374	4	4	.7612	.9718	3	4	.6047
31332	Malt	34	.5652	.6776	6	9	.4074	.5267	10	14	.8003	.8753	3	3	.3692
	Soft drinks and carbonated waters industries														
31340	Aerated waters and soft drinks including syrups; but excluding establishments primarily producing fruit juices (subgroup 31130)	98	.4226	.5255	13	22	.3571	.4614	20	31	.5308	.6848	6	11	.3024
314	Manufacture of tobacco products														
31400	Cigarettes, cigars, tobacco, snuff, etc.	15	.9840	.9949	2	2	.8812	.9634	1	2	.9453	.9844	2	2	.7828

32 Textiles/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total tunrover: y = 70%	Turnover: Number of largest firms with at least y% of total tunrover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
32	Textile, Wearing Apparel and Leather Industries														
321	Manufacture of textiles														
	Spinning, weaving and finishing of textiles														
32110	Wool scouring and combing	10	.7426	.8956	3	4	.6175	.8195	4	5	.8714	.9500	3	3	.5475
32111	Cotton ginning	6	.8442	.9851	2	3	.8528	.9632	2	3	.8314	.9685	2	3	.6580
32112	Fibre working (animal and vegetable)	2	1.0000	1.0000	1	1	1.0000	1.0000	1	1	1.0000	1.0000	1	1	.9127
32113	Dyeing, bleaching, printing and finishing	16	.9235	.9689	2	2	.8272	.9015	2	3	.8525	.9644	2	3	.6999
32114	Blankets	10	.7883	.9151	3	4	.7944	.9228	2	4	.7176	.9069	3	4	.6053
32115	Spinning, weaving and finishing of woollen yarns and fabrics, except blankets, carpets and rugs	17	.5556	.8322	4	5	.5342	.7252	5	7	.6291	.8247	4	5	.4096
32116	Spinning, weaving and finishing of non-woollen yarns and fabrics, except blankets, carpets and rugs	69	.3549	.4438	14	19	.3692	.4608	12	16	.3115	.4212	13	17	.2623
	Manufacture of made-up textile goods, except wearing apparel														
32120	Soft furnishings (including bias binding and embroidery)	101	.2691	.3555	19	26	.1368	.2159	31	42	.5440	.6302	7	12	.1609
32121	Bags and sacks (from piece goods)	24	.5191	.7118	5	7	.5699	.7122	5	8	.6851	.8385	4	5	.3751

32122/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
32122	Tents, tarpaulins, sails and other canvas goods	33	.4155	.5727	9	12	.3693	.4826	11	14	.3800	.5518	8	11	.2905
32123	Automotive textile goods (including seat covers, safety belts and upholstering)	51	.5018	.6799	6	8	.5533	.7169	5	7	.6849	.7904	4	6	.3515
	Knitting mills														
32130	Hosiery and other knitted clothing mills	92	.1687	.2668	22	30	.1716	.2672	23	30	.2494	.3736	17	23	.1125
32139	Other knitting mills	35	.3447	.4992	9	12	.3425	.4897	10	13	.4462	.5833	8	10	.2266
	Manufacture of carpets and rugs														
32140	Carpets and rugs and mats and matting	13	.6071	.7624	5	6	.6515	.7937	4	6	.7099	.8828	3	4	.4974
	Cordage, rope and twine industries														
32150	Rope, cable, cordage, twine, net and related products	12	.9061	.9667	1	2	.8769	.9469	1	2	.9366	.9831	1	1	.7797
	Manufacture of textiles not elsewhere classified														
32190	Linoleum and coated fabrics	8	.8871	.9778	2	3	.8517	.9538	3	3	.9619	.9890	3	3	.6673
32191	Pressed felt, padding, wadding and upholstery filling; tyre cord and fabric	19	.5787	.7140	5	7	.5676	.6822	6	8	.5030	.6629	6	8	.4203

322 Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
322	Manufacture of wearing apparel, except footwear														
32200	Men's and boys' clothing factories	230	.1464	.2015	47	66	.1341	.1887	51	72	.2090	.2832	32	51	.1072
32201	Men's and boys' hat and cap factories	19	.5281	.6889	6	7	.4420	.6369	6	8	.7471	.8469	3	4	.3850
32202	Tie factories	16	.6794	.8016	4	5	.5237	.7218	5	7	.7168	.8379	3	4	.4529
32203	Bespoke tailoring	455	.0691	.1083	136	191	.0676	.1006	180	143	.1147	.1534	85	125	.0381
32204	Women's and girls' clothing factories	405	.0938	.1340	83	117	.0857	.1204	110	149	.1434	.1956	82	125	.0534
32205	Furriers	26	.5291	.6201	7	10	.4746	.5791	8	11	.5792	.6717	6	10	.3476
32206	Millinery	38	.3621	.4974	10	14	.3384	.4857	10	14	.5282	.6221	8	11	.2283
323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel														
	Tanneries and leather finishing														
32310	Tanneries - leather a and fur	23	.4843	.6858	6	7	.4545	.6572	6	8	.4737	.6534	6	7	.3300
32311	Fellmongering	10	.5870	.8552	4	5	.6187	.8270	4	5	.7242	.9463	3	4	.4307
	Manufacture of products of leather and leather substitutes, except footwear and wearing apparel														
32330	Harness and saddlery	90	.5569	.8078	5	5	.5618	.8090	5	5	.6234	.7965	4	6	.4081

32331 Travel goods/....

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
32331	Travel goods	25	.3258	.5235	9	11	.3165	.4718	9	12	.5763	.7003	5	8	.2301
32332	Ladies' handbags	22	.4635	.6110	7	10	.4179	.5665	8	10	.5145	.6530	6	9	.2958
32339	General and small goods of leather and leather substitutes	37	.4080	.5477	9	12	.4174	.5435	9	13	.4105	.5491	9	13	.3099
324	Manufacture of footwear														
32400	Footwear (irrespective of material)	120	.2880	.3738	22	32	.2617	.3470	23	32	.3789	.4950	14	25	.1562

33 Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
33	Manufacture of Wood and Wood Products, including Furniture														
331	Manufacture of wood and wood cork products except furniture														
	Sawmills, planing and other wood mills														
33110	Sawmilling from the round log and preservation of timber	166	.1931	.2520	36	51	.1423	.1982	46	62	.2318	.3199	27	40	.1245
33111	Board - laminated, plywood, particle, etc.	29	.5139	.6876	6	8	.4397	.6128	7	9	.5565	.8458	4	5	.3628
33112	Wattle bark grinding and compressing	5	.9973	1.0000	1	1	.8652	1.0000	2	3	.9570	1.0000	1	2	.8217
33113	Sawmilling, not from the round log; carpentry and joinery works and prefabricated wooden buildings (except on site construction from purchased materials)	177	.1533	.2263	33	47	.1626	.2178	37	50	.2882	.3640	26	38	.0905
33119	Other mill products, - cooperage, wood-wool, etc.	8	.6173	.8078	4	5	.7551	.9271	3	4	.6172	.8229	4	5	.4312
	Manufacture of wooden and cane containers and small caneware														
33120	Wood and cane containers	44	.4605	.5701	9	13	.3405	.4347	13	17	.5229	.6403	7	10	.3317

Manufacture/....

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms, x = 3	Turnover: Turnover of the x largest firms, x = 5	Turnover: Number of largest firms with at least y% of total turnover, y = 70%	Turnover: Number of largest firms with at least y% of total turnover, y = 80%	Employment: Employment of the x largest firms, x = 3	Employment: Employment of the x largest firms, x = 5	Employment: Number of largest firms with at least y% of total employment, y = 70%	Employment: Number of largest firms with at least y% of total employment, y = 80%	Fixed assets: Fixed assets employed by the x largest firms, x = 3	Fixed assets: Fixed assets employed by the x largest firms, x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 80%	Horvath comprehensive measure of concentration based on turnover
	Manufacture of wood and cork products not elsewhere classified														
33190	Woodcarvind and woodturning	20	.5229	.7131	5	7	.5201	.6702	6	8	.7170	.8318	3	5	.3820
33191	Coffins (excluding the manufacture of coffins by funeral undertakers)	6	.9749	.9926	2	2	.8589	.9757	2	3	.9613	.9954	1	2	.7394
33192	Picture frames and framing	47	.2392	.3457	16	23	.2388	.3321	19	24	.2945	.4074	14	20	.1608
33199	Other wood and cork products	30	.5034	.6358	7	10	.4339	.5728	8	12	.3429	.4661	11	15	.4122
332	Manufacture of furniture and fixtures, except primarily of metal														
33200	Furniture, including upholstered furniture	643	.1929	.2303	87	132	.1239	.1487	117	172	.2460	.2858	65	114	.1611

34 Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
34	Manufacture of Paper and Paper Products, Printing and Publishing														
341	Manufacture of paper and paper products														
	Manufacture of pulp, paper and paperboard														
34110	Pulp, paper, paperboard and fibreboard	13	.7426	.8727	3	4	.6164	.7831	5	6	.6860	.8594	4	5	.5729
	Manufacture of containers and boxes of paper, fibreboard and paper substitutes														
34120	Manufacture of light packaging: non-corrugated, flexible, rigid and folding paper bags and boxes	51	.3931	.5119	9	12	.3601	.4769	11	15	.3820	.5333	8	11	.2921
34121	Manufacture of heavy packaging: paper sacks, balers and corrugated containers	17	.4207	.6046	7	8	.4511	.6145	7	8	.4651	.6479	6	8	.3213
	Manufacture of pulp, paper and paperboard articles not elsewhere classified														
34190	Stationery	18	.6428	.7536	4	7	.6340	.7502	5	7	.7216	.8537	3	5	.4571
34191	Other paper products	38	.4955	.5856	9	12	.4421	.5686	8	12	.6666	.7479	4	8	.3334
342	Printing, publishing and allied industries														
34200	Printing and publishing	664	.2483	.3230	56	110	.1877	.2531	84	154	.3516	.4123	29	74	.1612
34201	Publishing only, as a separate business	115	.4817	.5559	12	18	.3146	.4201	16	26	.4072	.5674	9	14	.3173
34202	Services for printers (trade houses)	65	.2913	.3834	19	27	.2762	.3799	18	27	.2430	.3580	17	23	.1709

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35	Manufacture of Chemicals and of Chemical, Petroleum, Coal, Rubber and Plastic Products														
351	Manufacture of industrial chemicals														
	Manufacture of basic industrial chemicals, except fertilizers														
35110	Tanning extract	3	1.0000	1.0000	2	2	1.0000	1.0000	2	2	1.0000	1.0000	1	2	.7467
35119	Other basic industrial chemicals	67	.5739	.6899	6	10	.5350	.6326	7	11	.7029	.7705	3	7	.4661
	Manufacture of fertilizers and pesticides														
35120	Fertilizers	15	.9065	.9889	2	2	.8500	.9566	2	3	.8816	.9939	2	3	.7026
35121	Pesticides, insecticides, fungicides and herbicides	22	.5112	.6999	6	7	.5714	.7604	5	6	.7816	.8694	2	4	.3861
35130	Manufacture of synthetic resins, plastic materials and man-made fibres, except glass	16	.7802	.8686	2	4	.7534	.8630	3	4	.8447	.9489	2	3	.6042
352	Manufacture of other chemical products														
35210	Manufacture of paints, varnishes and lacquers	70	.5476	.6299	8	12	.5254	.6043	9	15	.5056	.6189	8	11	.3766
35220	Manufacture of medicinal and pharmaceutical preparations	87	.1524	.2292	24	30	.1518	.2246	25	32	.4113	.5109	13	19	.0984

Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
	Manufacture of soap and cleaning preparations, perfumes, cosmetic and other toilet preparations														
35230	Soap, other cleaning compounds and candles	58	.8046	.8702	2	3	.6470	.7500	4	9	.7047	.8295	3	5	.6301
35231	Perfumes, cosmetics and other toilet preparations	64	.3123	.4975	9	13	.3390	.4692	12	16	.4301	.5748	8	12	.2149
	Manufacture of chemical products not elsewhere classified														
35290	Polishes, waxes and dressings	17	.7962	.8654	2	4	.7606	.8311	3	4	.9454	.9648	1	2	.6198
35291	Inks	7	.8395	.9829	2	3	.7873	.9791	3	4	.8847	.9891	2	3	.6372
35292	Matches	2	1.0000	1.0000	1	1	1.0000	1.0000	1	1	1.0000	1.0000	1	1	.9259
35293	Explosives and ammunition	4	.9936	1.0000	1	1	.9943	1.0000	1	2	.9974	1.0000	1	2	.8696
35294	Adhesives, glues, sizes and cements	25	.5214	.7032	5	8	.5350	.6986	6	8	.5872	.7506	5	6	.3365
35299	Other chemical products not elsewhere classified	20	.6809	.7749	4	6	.5845	.7433	5	7	.8199	.9209	2	3	.4515
353	Petroleum refineries														
35300	Petrol, fuel oils, lubricating oils and greases	23	.7672	.8897	3	4	.7465	.8723	3	4	.8170	.9546	3	3	.5724

354 Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
354	Manufacture of miscellaneous products of petroleum and coal														
35400	Compound and blended lubricating oils and greases from purchased materials other than crude petroleum	10	.8507	.9237	2	2	.6146	.7707	4	6	.8333	.9220	2	3	.6709
35401	Other petroleum and coal products n.e.c.	20	.5237	.7078	5	7	.5456	.7032	5	7	.4883	.6944	6	7	.3626
355	Manufacture of rubber products														
35510	Manufacture of tyres and tubes	5	.8575	1.0000	3	3	.8700	1.0000	3	3	.8409	1.0000	3	3	.6040
35590	Manufacture of rubber products not elsewhere classified	56	.4916	.5796	9	15	.4702	.5706	10	15	.4044	.5229	10	14	.3593
356															
35600	Manufacture of plastic products not elsewhere classified	248	.1235	.1906	44	65	.1026	.1527	58	85	.1699	.2390	36	54	.0722

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
36	Manufacture of Non-metallic Mineral Products except Products of Petroleum and Coal														
361															
36100	Manufacture of pottery, china and earthware	37	.4487	.6830	6	7	.4575	.6412	6	9	.5136	.7416	5	6	.3220
362	Manufacture of glass and glass products														
36200	Sheet and plate, glass containers and other glassware not elsewhere classified	12	.9669	.9799	1	2	.9789	.9871	1	2	.9752	.9946	2	2	.8244
36201	Glass bevelling and silvering, safety glass and other glass products	23	.7808	.8607	2	4	.6865	.7819	4	6	.9138	.9626	2	2	.5853
36202	Scientific and laboratory glassware, except the grinding of optical lenses	4	.9807	1.0000	1	2	.9885	1.0000	1	2	.9881	1.0000	1	2	.8043
369	Manufacture of other non-metallic mineral products														
	Manufacture of structural clay products														
36910	Bricks, tiles, refractories, etc.	298	.4223	.5610	13	24	.2994	.3917	39	69	.3783	.4868	13	23	.2577
36920	Manufacture of cement	8	.6682	.8724	4	5	.7211	.8779	3	4	.8331	.9394	3	3	.4675

Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms: x = 3	Turnover: Turnover of the x largest firms: x = 5	Turnover: Number of largest firms with at least y% of total turnover: y = 70%	Turnover: Number of largest firms with at least y% of total turnover: y = 80%	Employment: Employment of the x largest firms: x = 3	Employment: Employment of the x largest firms: x = 5	Employment: Number of largest firms with at least y% of total employment: y = 70%	Employment: Number of largest firms with at least y% of total employment: y = 80%	Fixed assets: Fixed assets employed by the x largest firms: x = 3	Fixed assets: Fixed assets employed by the x largest firms: x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets: y = 80%	Horvath comprehensive measure of concentration based on turnover
	Manufacture of non-metallic mineral products not elsewhere classified														
36990	Plaster and other composite sheets, pipes, etc. from gypsum, cement, asbestos, etc.	13	.8222	.9410	3	3	.7269	.8959	3	4	.8941	.9687	2	2	.6180
36991	Cement products	224	.2279	.3322	24	40	.2001	.2443	52	76	.2584	.3708	18	27	.1494
36992	Stone and slate products	73	.2749	.3755	21	31	.1974	.2789	27	37	.2710	.4124	18	26	.1655
36993	Abrasives	14	.7360	.8600	3	4	.5906	.7550	5	6	.8629	.9703	3	3	.5097
36999	Other non-metallic products n.e.c.	36	.4784	.6446	7	11	.4192	.5822	9	13	.5848	.7468	5	7	.3006

Basic/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
37	Basic Metal Industries														
371	Iron and steel basic industries														
37100	Iron and steel basic industries	113	.6727	.7567	4	7	.6380	.7183	5	10	.8760	.9148	2	2	.5709
37101	Steel pipe and tube mills	21	.4733	.6451	6	8	.5590	.7266	5	7	.5020	.6922	6	7	.3569
372	Non-ferrous metal basic industries														
37200	Primary non-ferrous metal products excluding precious metals	84	.3644	.5025	11	15	.3176	.4460	14	22	.6828	.7808	4	6	.2282
37201	Precious metal refining on a fee or contract basis	4	.9293	1.000	2	2	.9430	1.0000	2	2	.9721	1.0000	2	2	.7074

Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms, x = 3	Turnover: Turnover of the x largest firms, x = 5	Turnover: Number of largest firms with at least y% of total turnover, y = 70%	Turnover: Number of largest firms with at least y% of total turnover, y = 80%	Employment: Employment of the x largest firms, x = 3	Employment: Employment of the x largest firms, x = 5	Employment: Number of largest firms with at least y% of total employment, y = 70%	Employment: Number of largest firms with at least y% of total employment, y = 80%	Fixed assets: Fixed assets employed by the x largest firms, x = 3	Fixed assets: Fixed assets employed by the x largest firms, x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 80%	Horvath comprehensive measure of concentration based on turnover
38	Manufacture of Fabricated Metal Products, Machinery and Equipment														
381	Manufacture of fabricated metal products, except machinery and equipment														
38110	Manufacture of cutlery, hand tools and general hardware	49	.3454	.5079	11	15	.2796	.4254	11	14	.3336	.5049	9	13	.2332
38120	Manufacture of furniture and fixtures primarily of metal, except upholstered or padded furniture	77	.3211	.4768	13	20	.3095	.4648	14	23	.4551	.5873	7	13	.1971
	Manufacture of structural metal products														
38130	Building hardware	149	.2485	.3159	33	50	.2134	.2622	38	55	.2889	.3699	24	37	.1613
38131	Structural steel work; prefabricated steel buildings (excluding on-site erection from purchased materials)	240	.1534	.2446	33	52	.1775	.2541	35	56	.2023	.2905	23	40	.0936
38132	Ornamental and architectural metal work	129	.2190	.3178	27	40	.1764	.2593	38	54	.1786	.2722	28	42	.1287
38133	Boiler manufacture and installation (excluding installation from purchased materials)	41	.6181	.7513	4	7	.4867	.6209	7	9	.4807	.6562	6	9	.4866
38134	Sheet metal products	115	.2801	.3450	26	37	.2010	.2070	32	45	.3773	.4426	23	36	.1879

Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
	Manufacture of fabricated metal products, except machinery and equipment not elsewhere classified														
38190	Tinware	42	.7443	.8470	3	5	.7008	.8110	3	5	.7801	.9080	3	4	.5953
38191	Cables, wire products and gates	83	.4311	.5629	9	14	.3814	.5002	13	26	.5087	.6120	8	11	.2941
38192	Springs (all types)	25	.6836	.7823	4	6	.6270	.7193	5	9	.7018	.8067	3	5	.4835
38193	Headed and threaded articles	48	.4958	.6732	6	9	.5285	.6336	7	12	.5796	.6960	6	9	.3382
38194	Engineering workshops, welding, fitting and turning	420	.0927	.1279	64	159	.0573	.0844	145	200	.1259	.1687	110	156	.0554
38195	Electroplating, anodizing, tinning, galvanizing, enamelling, industrial spray painting, plastic coating and sand blasting of metal products	100	.1827	.2628	25	36	.1485	.2333	27	39	.2646	.3696	22	32	.1245
38199	All other metal products n.e.c.	371	.1712	.2331	66	102	.1605	.2122	72	111	.2754	.3268	51	83	.1182
382	Manufacture of machinery, except electrical														
38210	Manufacture of engines and turbines	3	1.0000	1.0000	1	2	1.0000	1.0000	12	2	1.0000	1.0000	1	2	.8340
38220	Manufacture of agricultural machinery and equipment, except agricultural tractors	92	.2959	.4260	16	24	.3136	.4343	17	26	.3305	.4411	15	23	.2055
38230	Manufacture of metal and woodworking machinery	41	.4868	.6615	6	8	.4391	.6064	7	9	.4830	.6671	6	9	.3452

Manufacture/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms, x = 3	Turnover: Turnover of the x largest firms, x = 5	Turnover: Number of largest firms with at least y% of total turnover, y = 70%	Turnover: Number of largest firms with at least y% of total turnover, y = 80%	Employment: Employment of the x largest firms, x = 3	Employment: Employment of the x largest firms, x = 5	Employment: Number of largest firms with at least y% of total employment, y = 70%	Employment: Number of largest firms with at least y% of total employment, y = 80%	Fixed assets: Fixed assets employed by the x largest firms, x = 3	Fixed assets: Fixed assets employed by the x largest firms, x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 80%	Horvath comprehensive measure of comcentration based on turnover
38240	Manufacture of special industrial machinery and equipment, except metal and woodworking machinery	436	.1497	.2174	51	83	.1732	.2261	64	103	.2087	.2700	43	67	.0910
38250	Manufacture of office, computing and accounting machinery	6	.9441	.9887	2	3	.7973	.9459	3	4	.9224	.9875	2	2	.6626
	Machinery and equipment, except electrical, not elsewhere classified														
38290	Refrigerators, washing machines, stoves and ovens	47	.6338	.8152	4	5	.6623	.7901	4	6	.8024	.9014	3	3	.4352
38291	Tractors - agricultural and other	6	.9875	.9992	1	1	.8616	.9686	2	3	.9864	.9980	1	2	.9404
38292	Air conditioning and ventilation machinery and refrigeration equipment	90	.2376	.3553	18	26	.2338	.3497	20	28	.3794	.4394	17	24	.1521
38299	All other machinery n.e.c.	156	.2168	.3187	19	29	.2170	.3182	23	37	.2877	.4174	12	18	.1358
383	Manufacture of electrical machinery, apparatus, appliances and supplies														
38310	Manufacture of electrical industrial machinery and apparatus	235	.2737	.3415	30	49	.2497	.3325	35	55	.2881	.4056	19	32	.1956
38320	Manufacture of radio, television and communication equipment and apparatus	66	.6184	.7370	5	8	.5455	.7213	5	9	.6197	.7842	4	6	.4608

Manufacture/.....

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
38330	Manufacture of electrical appliances and housewares	62	.3673	.4840	12	17	.2809	.4065	12	17	.6131	.7031	5	9	.2364
	Manufacture of electrical apparatus and supplies not elsewhere classified														
38390	Insulated wires and cables	12	.6919	.8450	4	5	.7550	.8558	3	4	.8087	.9144	3	3	.4843
38391	Dry cell batteries	4	.9773	1.0000	1	1	.9698	1.0000	1	2	.9989	1.0000	1	1	.8631
38392	Wet cell batteries	18	.6853	.8103	4	5	.7202	.8156	3	5	.8619	.9266	2	2	.5054
38393	Electric bulbs and fluorescent tubes	6	.9132	.9919	2	2	.8777	.9837	2	3	.9673	.9942	2	3	.7157
38399	Electrical products n.e.c.	40	.3488	.5083	10	13	.3767	.5485	9	13	.7694	.8502	3	4	.2400
384	Manufacture of motor vehicles, parts and accessories														
38400	Motor vehicles	23	.5259	.7141	5	7	.4711	.6790	6	7	.4940	.7088	5	7	.3624
38401	Caravans, trailers and vehicle bodies	128	.2199	.3409	22	33	.2555	.3276	27	40	.2537	.3660	20	31	.1357
38402	Radiators	18	.8177	.8742	2	3	.6951	.7804	4	6	.6992	.8677	4	4	.7063
38403	Motor vehicle parts and accessories n.e.c.	113	.2630	.3586	20	30	.2418	.3303	21	30	.4610	.6175	7	12	.1547
38409	Specialised automotive engineering workshops working primarily for the trade	248	.0957	.1297	85	114	.0831	.1139	94	122	.0685	.1054	85	113	.0642
385	Manufacture of transport equipment, except motor vehicles, parts and accessories														
	Ship building and repairing														

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms, x = 3	Turnover: Turnover of the x largest firms, x = 5	Turnover: Number of largest firms with at least y% of total turnover, y = 70%	Turnover: Number of largest firms with at least y% of total turnover, y = 80%	Employment: Employment of the x largest firms, x = 3	Employment: Employment of the x largest firms, x = 5	Employment: Number of largest firms with at least y% of total employment, y = 70%	Employment: Number of largest firms with at least y% of total employment, y = 80%	Fixed assets: Fixed assets employed by the x largest firms, x = 3	Fixed assets: Fixed assets employed by the x largest firms, x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 80%	Horvath comprehensive measure of concentration based on turnover
38510	Ship and boat building and repairs	41	.6631	.8145	4	5	.6148	.7771	4	6	.8419	.9301	2	3	.4758
	Manufacture of railroad equipment														
38520	Locomotives, coaching and goods-stock	26	.7568	.8490	3	4	.7965	.8646	2	4	.6607	.7865	4	6	.5678
	Manufacture of motor cycles and bicycles														
38540	Motor cycles, scooters, bicycles, tricycles and relevant specialized parts	10	.9595	.9835	1	1	.9720	.9888	1	1	.9839	.9979	1	1	.8336
	Manufacture of aircraft														
38550	Aircraft manufacture and repair	13	.9517	.9811	1	1	.9639	.9823	1	1	.9949	.9972	1	1	.9047
	Manufacture of transport equipment not elsewhere classified														
38590	Animal- and hand-drawn vehicles	23	.6997	.8185	4	5	.7183	.8313	3	5	.7865	.8623	3	4	.4924
386	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods														
	Manufacture of professional and measuring and controlling equipment not elsewhere classified														

Laboratory/...

Sub-group	Title of category	Number of firms in sub-group	Turnover				Employment				Fixed assets				Horvath comprehensive measure of concentration based on turnover
			Turnover of the x largest firms		Number of largest firms with at least y% of total turnover		Employment of the x largest firms		Number of largest firms with at least y% of total employment		Fixed assets employed by the x largest firms		Number of largest firms with at least y% of total fixed assets		
			x = 3	x = 5	y = 70%	y = 80%	x = 3	x = 5	y = 70%	y = 80%	x = 3	x = 5	y = 70%	y = 80%	
38610	Laboratory and scientific instruments, and measuring and controlling equipment, n.e.c.	36	.4148	.5752	9	13	.3942	.5276	9	13	.4061	.5412	10	14	.2918
38611	Orthopaedic appliances and supplies	10	.5976	.8129	4	5	.5479	.7397	5	6	.6459	.8006	4	5	.4623
38612	Surgical, medical and dental supplies	17	.8224	.9043	2	3	.7911	.9096	3	4	.9498	.9806	2	2	.6285
38620	Manufacture of photographic and optical goods	25	.4736	.6349	6	9	.4597	.6041	7	10	.4085	.6078	7	9	.3006
38630	Manufacture of watches and clocks	6	.9903	.9990	1	1	.9375	.9792	1	2	.9805	.9990	1	1	.8869

Other/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms, x = 3	Turnover: Turnover of the x largest firms, x = 5	Turnover: Number of largest firms with at least y% of total turnover, y = 70%	Turnover: Number of largest firms with at least y% of total turnover, y = 80%	Employment: Employment of the x largest firms, x = 3	Employment: Employment of the x largest firms, x = 5	Employment: Number of largest firms with at least y% of total employment, y = 70%	Employment: Number of largest firms with at least y% of total employment, y = 80%	Fixed assets: Fixed assets employed by the x largest firms, x = 3	Fixed assets: Fixed assets employed by the x largest firms, x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets, y = 80%	Horvath comprehensive measure of concentration based on turnover
39	Other Manufacturing Industries														
390	Manufacture of jewelry and related articles														
39010	Jewelry and related articles composed of precious metals, precious and semi-precious stones and pearls	170	.1642	.2244	37	55	.1958	.2498	47	69	.1208	.1844	44	61	.0925
39011	Diamond cutting and polishing	46	.2697	.3713	16	23	.2194	.3184	19	25	.3368	.4640	14	20	.2019
39019	Other precious and semi-precious stone cutting and polishing	3	1.0000	1.0000	2	2	1.0000	1.0000	2	2	1.0000	1.0000	2	3	.7828
39020	Manufacture of musical instruments	18	.6560	.8492	4	5	.6359	.8250	4	5	.7374	.8973	2	3	.4724
39030	Manufacture of sporting and athletic equipment	22	.6444	.7564	4	6	.5653	.7072	5	8	.7845	.8421	3	4	.4525
	Manufacturing industries not elsewhere classified														
39090	Toys	22	.5469	.7335	5	7	.5944	.7331	5	7	.7367	.8940	3	4	.3662
39091	Brushes and brooms	26	.4135	.5825	8	10	.4126	.5672	8	10	.4760	.6389	6	8	.3008
39092	Crayons, chalk, pens and pencils	5	.8124	1.0000	3	3	.7874	1.0000	3	5	.8934	1.0000	3	3	.6306
39093	Buttons, buckles, slide fasteners, etc.	24	.4559	.6342	6	8	.4505	.6762	6	8	.5934	.7691	4	6	.3190
39094	Number plates, signs and advertising displays, except electrical and mechanical	73	.3006	.3828	19	29	.2847	.3667	23	32	.3723	.4512	18	27	.1943

Number/...

Sub-group	Title of category	Number of firms in sub-group	Turnover: Turnover of the x largest firms x = 3	Turnover: Turnover of the x largest firms x = 5	Turnover: Number of largest firms with at least y% of total turnover y = 70%	Turnover: Number of largest firms with at least y% of total turnover y = 80%	Employment: Employment of the x largest firms x = 3	Employment: Employment of the x largest firms x = 5	Employment: Number of largest firms with at least y% of total employment y = 70%	Employment: Number of largest firms with at least y% of total employment y = 80%	Fixed assets: Fixed assets employed by the x largest firms x = 3	Fixed assets: Fixed assets employed by the x largest firms x = 5	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 70%	Fixed assets: Number of largest firms with at least y% of total fixed assets y = 80%	Horvath comprehensive measure of concentration based on turnover
39095	Signs and advertising displays, electrical and mechanical	24	.5730	.7041	5	8	.4787	.6277	7	9	.7256	.8090	3	5	.4269
39096	Lamps and lamp shades	17	.5492	.7308	5	7	.5547	.7007	5	7	.7327	.8323	3	5	.3831
39097	Pattern-making, other than paper patterns	25	.5007	.6074	7	10	.5363	.6371	7	10	.3588	.4832	10	13	.4021
39098	Engraving	18	.5301	.7176	5	7	.4322	.6181	7	9	.5398	.7025	5	7	.3508
39099	Other industries n.e.c., including rubber stamps, taxidermists, ostrich feathers, costume jewelry and novelties, umbrellas and canes	70	.3392	.4273	16	22	.4217	.5021	14	22	.4089	.5147	12	17	.2436

APPENDIX 6

CONCENTRATION INDEXES FOR FIVE-DIGIT WHOLESALE, RETAIL AND CONSTRUCTION INDUSTRIES IN SOUTH AFRICA - 1972

This Appendix contains the indexes for four variants of the common concentration ratio each based on the variable turnover.

Measures:	Variable
CR_3	Turnover
CR_5	
$CR_{70\%}$	
$CR_{80\%}$	

Industry number	Title of Category	Turnover: Number of firms in industry	Percentage of total turnover of the y largest firms: Y = 3	y = 5	Number of largest firms with at least x% of total turnover: x = 70%	x = 80%
	MAJOR DIVISION 5, CONSTRUCTION					
51	Building Construction					
510	Building Construction					
51010	Building construction by general contractors	3 554	15,3	18,8	281	543
	Building construction by special trade Contractors					
51020	Painting and decorating	408	12,4	16,8	72	110
51021	Plumbing	753	11,4	14,6	144	230
51022	Electrical contracting	1 134	18,7	25,3	181	307
51023	Shopfitting	110	40,7	52,3	12	21
51029	Other special contracting n.e.c.	1 154	15,6	20,4	107	172
52						
52000	Civil Engineering and Construction not elsewhere classified	710	10,3	15,9	72	113

Industry number	Title of Category	Turnover: Number of firms in industry	Percentage of total turnover of the y largest firms: y = 3	y = 5	Number of firms with at least x% of total turnover: x = 70%	x = 80%
	MAJOR DIVISION 6, WHOLESALE AND RETAIL TRADE EXCLUDING THE MOTOR, MOTOR ACCESSORY AND MOTOR REPAIR TRADES					
610	Wholesale Trade and Allied Services					
	Wholesale trade, except in motor vehicles and accessories					
61000	Foodstuffs	598	7,95	12,36	111	166
61001	Beverages	34	77,46	84,34	2	4
61002	Tobacco	94	40,80	47,63	16	25
61003	Agricultural and pastoral products including livestock	409	29,93	37,60	35	63
61004	Textiles, footwear and clothing	693	17,51	22,33	111	176
61005	Furniture, household requisites and household appliances	288	15,43	21,61	51	78
61006	Books, stationery and office and shop equipment	349	17,14	23,95	46	72
61007	Precious stones, jewellery and silverware	177	86,74	89,56	2	3
61008	Industrial and heavy chemicals	47	48,22	63,87	7	11
61009	Pharmaceuticals and toiletries	198	23,91	31,85	23	36
61010	Construction and building materials	735	5,97	8,65	170	242
61011	Petroleum products	41	39,15	57,93	7	9
61012	Machinery and equipment - mining, industrial and agricultural	1 248	7,21	11,01	177	283
61013	General merchandise	148	20,12	28,15	31	45
	Specialised repair services					
61300	Typewriters and other office equipment	7	69,94	92,63	4	4
61301	Agricultural machinery and implements and farm tractors	71	71,27	75,73	3	9

Industry number	Title of Category	Turnover			
		Number of firms in industry	Percentage of total turnover of the y largest firms		Number of firms with at least x% of total turnover	
			y = 3	y = 5	x = 70%	x = 80%
620	Retail Trade and Allied Services					
	Retail trade, except motor trade and repair services					
62000	Butchers	4 017	4,84	6,43	1 151	1 634
62001	Dairies and dealers in dairy products	445	21,52	29,91	55	96
62002	Grocers and other dealers in foodstuffs	14 695	15,43	17,73	3 758	5 384
62003	Bottle stores	972	4,55	6,44	276	502
62004	Men's outfitters	1 096	7,63	9,61	328	463
62005	Ladies' outfitters	1 192	19,70	27,46	117	257
62006	General outfitters and dealers in piece goods and textiles	2 851	8,87	13,23	419	734
62007	Shoe stores	510	17,24	24,41	67	123
62008	Dealers in furniture, household requisites and household appliances	2 444	6,78	9,20	486	729
62009	Book stores and stationers	544	35,61	43,56	34	80
62010	Jewellers	717	10,86	13,41	215	293
62011	Chemists	2 042	1,21	1,79	881	1 118
62012	Building material and hardware merchants	671	8,13	11,05	172	242
62013	Bicycle and motor cycle dealers	400	19,71	25,97	76	115
62014	Fuel and coal merchants	508	30,10	34,68	45	83
62015	Dealers in sport and entertainment requisites	604	8,43	12,71	143	219
62016	General departmental stores	117	63,96	72,90	5	8
62017	General dealers	11 512	5,51	6,42	2 910	4 430
62019	Dealers in miscellaneous goods	1 748	5,66	8,09	412	631
	Specialised repair services					
62100	Repair of footwear and other leather goods	358	35,69	41,46	62	106
62101	Repair, servicing and installation of electrical and non-electrical household and personal appliances	127	12,87	18,67	39	53
62102	Blacksmith shops	12	50,20	73,17	5	6
62103	Watch, clock and jewellery repair	61	19,66	24,15	22	29
62109	Other repair and servicing establishments, nec	80	39,65	46,58	16	24